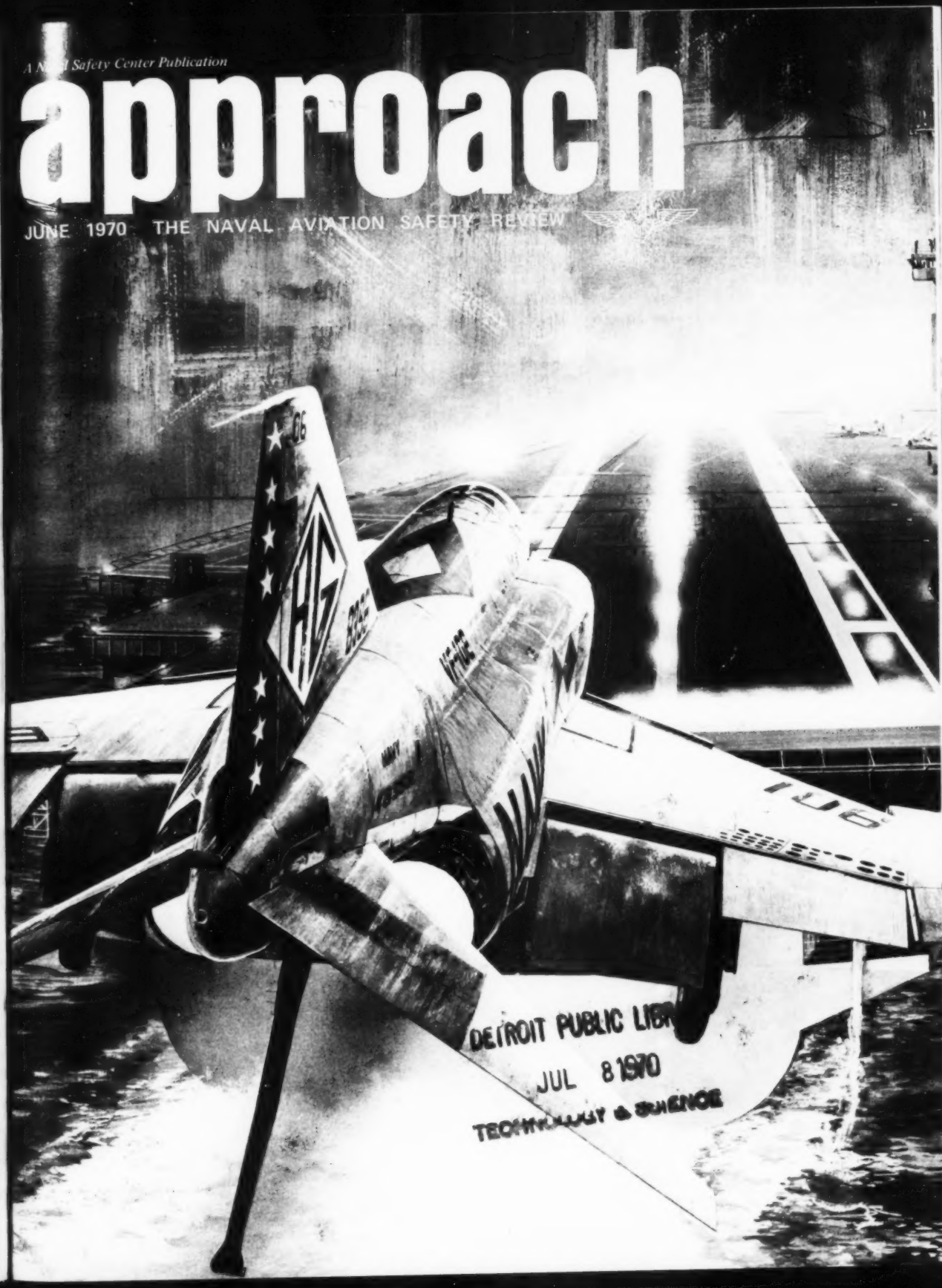
A Naval Safety Center Publication

approach

JUNE 1970 THE NAVAL AVIATION SAFETY REVIEW



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TECHNOLOGY & SCIENCE

AIRCRAFT FIRES and EXPLOSIONS



During FY 69 there were 44 major aircraft accidents involving fire/explosion. This represents more than eight percent of all major accidents in FY 69. In addition, there were 116 minor accidents or incidents involving fire/explosion. Many of these were prevented from becoming more serious only by the prompt execution of NATOPS emergency procedures.

FIRE or explosion in flight is one of the most serious problems which can confront any pilot. When it occurs, the pilot must react promptly and correctly. But even if he does, at this stage of the game a complete solution to the problem may be beyond the pilot's capability as the following report of an RF-8G fire in flight shows.

The RF-8G was preflighted by the pilot in preparation for a maintenance test flight following replacement engine installation. Start and poststart checks were normal and after giving all instruments a thorough check, the pilot made an afterburner takeoff and initial climbout. The afterburner was secured during the climb and the pilot leveled off at 17,000 feet.

The flight proceeded routinely for about 30 minutes during which time the pilot changed altitude several times. Then the pilot again selected afterburner and descended from 7000 to 3500 feet, attaining a speed of 590 kias. Up to this time all engine and hydraulic system indications had been normal but about 30 seconds after the afterburner was secured, the fire warning light illuminated. The pilot checked all his instruments but did not observe any other abnormalities. He then initiated a hard, port climbing turn and saw some smoke trailing but concluded that it was not excessive. Next, he reduced power to IDLE, noting a decrease in exhaust gas temperature. However, the fire warning light still remained illuminated. He then leveled off at about 8000 feet, 250 kias and set his power at 89 percent.

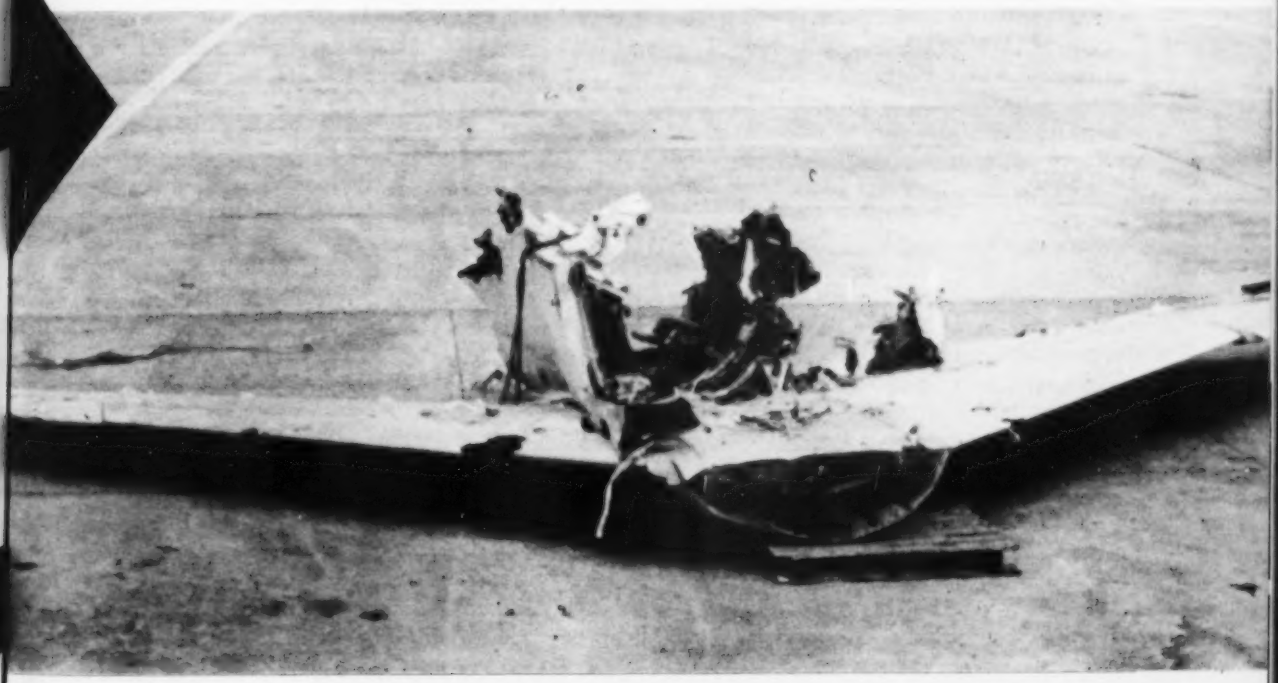
After level off, the PC-2 hydraulic pressure indicator fluctuated momentarily, then dropped to ZERO. The engine oil/hydraulic pressure and yaw stabilization lights also came on. The pilot made an emergency call to NAS Homeplate tower but received no acknowledgement. He then noted the utility hydraulic pressure had dropped to ZERO and the oil pressure had slowly dropped to 20 psi where it stabilized.

During this period the pilot was proceeding on a northerly course toward NAS Homeplate in a gradual descent from 8000 feet at 250 kias. During the descent, the engine fuel pump light came on but the engine continued to run with steady EGT and stabilized RPM.

About 15 miles from NAS Homeplate, while descending through 5000 feet, the pilot lowered the gear pneumatically and unlocked the wing preparatory to raising it for landing. As he passed through 2500 feet, the engine started to unwind. He pushed forward on the throttle but obtained no response. He then ejected from the aircraft at about 2000 feet and 220 kias. After the ejection, he saw the burning aircraft impact with the water and explode.

Most of the aircraft wreckage was lost but a part of it was salvaged (see photograph); however, the

1



investigators were unable to determine the cause of the accident. The pilot was rescued by a fishing boat in the area and was safely returned to home base.

Recognizing the Existence of a Fire

All jet aircraft and many prop aircraft have fire or overheat warning devices located in one or more critical areas such as engine nacelles, around engine compressors, tailpipes and accessory sections. Any fire or overheat condition which occurs in these areas should activate a warning light or lights on the instrument panel of the aircraft. Most of these devices are designed to warn of *overheat* which may occur in advance of actual fire and, hopefully, provide the pilot with a warning – and the time – to take corrective action before an actual fire develops. Unfortunately, the performance of these devices in positively indicating the existence of an overheat condition or fire is somewhat less than 100 percent perfect in practice. Therefore, most aircraft NATOPS emergency procedures are designed to provide the pilot with procedures for obtaining some confirmation of the existence of a fire before he takes drastic emergency action such as shutting down an engine. Typically, the pilot will look for evidence of high tailpipe temperature, high cylinder head temperature, excessive fuel flow, etc. He may also look for malfunctions in other aircraft systems because experience has shown that other emergencies typically accompany an inflight fire, *in some aircraft*, such as the loss of hydraulic pressure or failure of the oxygen system.

One of the most effective methods of confirming the existence of a fire is by visual examination of the suspect engine or surrounding airframe area. In the case of a suspected engine fire, pilots of prop aircraft can usually perform a pretty good inspection by simply looking out the window or canopy. Jet pilots, on the other hand, and particularly fighter/attack types, usually are unable to view their engines directly. This disadvantage is often offset by the fact that they are in company with one or more other aircraft and can have one of the other pilots look their aircraft (and engines) over for evidence of fire. In the absence of other aircraft, the jet pilot can usually maneuver his aircraft so as to obtain a good view of his engine exhaust trail and can examine it for heavy smoke or other indications of the existence of fire, although this procedure was ineffective in the accident just recounted.

In the absence of direct corroboration of a fire, prompt execution of NATOPS emergency procedures will lessen potential hazards. These procedures are designed to progressively check out various aircraft indications and systems while providing the crew with maximum safety in the event an actual fire exists, e.g., a



reduction of throttle to IDLE to see if a reduction of fuel flow will cause the warning light(s) to go out. Whether the engine will be shut down (when existence of a fire has not been definitely established) will depend on the specific indications, model aircraft, number of engines, etc. Each model aircraft is different and corrective action must be based on the specific NATOPS procedures for that particular type.

Time Is of the Essence

Whatever the indications of fire and whatever the model aircraft involved, time is of the essence in taking corrective action. *Prompt* action, incidentally, is equally important in prop and jet aircraft, as the following US-2A aircraft accident report indicates.

The US-2A took off on a local training flight for the purpose of providing the copilot with operational experience in the aircraft for eventual qualification as first pilot. Also aboard were two aircrewmen: a crew chief and a crew chief under training.

Flight planning, preflight inspection, briefing and runup were conducted in accordance with published directives. Takeoff, climb and level off were uneventful with no noticeable discrepancies noted in the aircraft. After level off, the aircraft was flown toward a nearby civilian airport, its tower was contacted and a request was made for clearance into the control zone and traffic pattern for the purpose of practicing touch-and-go landings. Clearance was granted and prior to landing mixtures were placed in RICH, fuel boost pumps were turned ON and heaters were checked OFF. One touch-and-go landing was completed and a request was then made to enter downwind for a different runway and more touch-and-go's. Clearance was granted as requested.

While in a left-hand turn entering downwind, the crew chief smelled fuel fumes in the crew's compartment and requested that the pilot make a full stop landing so that he could check the aircraft over to determine, if possible, the cause of the fumes. At that time, the crew chief once again checked to see if the heaters were OFF and observed that there were no fluctuations in fuel pressure, nor was there any excess spread in the fuel quantity readings.

The pilot requested a full stop landing. The tower granted the request and inquired if the aircraft was having any trouble, to which the pilot answered, "Negative."

An aircraft which landed just ahead of the US-2A had reported light turbulence on final and this prompted the tower operator to observe the US-2A's landing approach with field glasses to determine the effect of the turbulence.

The approach, with two-thirds flaps, was normal in all respects as was the landing. However, upon touchdown, the tower operator notified the pilot that the left engine was on fire and alerted the crash crews. The aircraft continued up the runway and during rollout the pilot experienced some braking problems. The fire warning light for the port engine also came on momentarily. The pilot secured the burning engine by moving the mixture control to IDLE CUTOFF. (Note: This was the only action taken by the pilot to secure the engine.) Thereafter, the port fire warning light came on and remained on.

The left brake failed completely just before the aircraft came to a complete stop causing it to go off the right side of the runway far enough to clear the runway surface. It finally came to a complete stop in a position which placed the burning engine on the upwind side of the aircraft.

In the meantime the crew chief had jettisoned the right overhead escape hatch at a point about 100 feet before the aircraft left the runway. This action was taken because flames coming from the left engine were visible from the crew's compartment and there was also a considerable build-up of smoke inside the aircraft.

With the wind blowing the flames over the fuselage, the crew realized the need for immediate evacuation of the aircraft. The crew chief, followed by the student crew chief and copilot, evacuated the aircraft via the upper escape hatch, over and off the wing, while the pilot chose to exit through the cabin door.

Crash crew personnel and equipment arrived about the time the fire had progressed to the fuel cells but were unable to prevent total destruction of the aircraft (see photograph).

In this case, the aircraft accident board was unable to determine the exact cause but stated the most probable cause to have been a material failure or malfunction of the fuel system in the vicinity of the left engine firewall. The board also noted that the pilot's judgment in not declaring an emergency and his failure to secure the left engine completely in accordance with NATOPS "Engine



Fire on Deck" procedures, while not contributing to the cause of the accident, may well have contributed to the extent of the damage. If an emergency had been declared earlier and crash crews alerted, response would have been quicker and probably could have reduced fire damage to the aircraft.

The Causes and Prevention of Fires/Explosions

Some fires/explosions occur because of poor engineering design, e.g., components installed in positions which interfere with moving parts. A continuous effort is made to identify and eliminate design deficiencies which have a potential to cause fire or explosions.

Most fires and explosions, however, are caused either by premature material failures or by maintenance personnel error. Some material failures are, of course, beyond prevention but in many cases careful attention to yellow sheet discrepancies and careful aircraft inspections can reveal conditions signaling impending material failures.

Typical maintenance errors which can lead to fire/explosion in flight include:

- Misrouting of fuel, oil and hydraulic lines which result in chafing and eventual failure, allowing fuel, oil or hydraulic fluid to come in contact with some source of ignition.
- Failure to reconnect lines following maintenance work or failure to properly torque and lockwire such lines, e.g., leaving connections finger-tight with vibration causing them to come loose.
- Failure to wipe down fuel, oil or hydraulic spills.
- Failure to investigate and correct the sources of fuel, oil and hydraulic leaks.

FOD is another important cause of inflight fires/explosions. The October 1969 issue of APPROACH contained an account of an A-4 fire in flight which was caused by leaving a wrench in the intake duct of the aircraft following servicing of the CSD just prior to takeoff. Other FOD such as nuts, bolts, lockwire, etc., also contributes its share to inflight fires by causing progressive failure of moving parts which eventually leads to fires or explosions.

The Pilot's Role

Assuming that the pilot operates his aircraft correctly, there is little that he can do, once airborne, to prevent the occurrence of an inflight fire or explosion – that is, there is little he can do before he gets some indication that trouble has developed. Even then, he is severely limited in his courses of action. Usually, he must content himself with the prompt execution of prescribed procedures in an effort to minimize danger and damage – and to get the aircraft and crew safely on deck. This is not to say that pilots can do nothing to reduce the *incidence* of inflight fires/explosions, *because they can*. They can do this by making thorough preflight and postflight inspections and by doing their share to contribute to good maintenance. This means making careful yellow sheet writeups on any condition or occurrence which might signal impending material failures. Examples of this are writing up overboosts, chip detector warning lights, overtemps, etc.

The importance (and benefit) of executing a careful preflight was classically illustrated recently by one F-8 pilot who noted fine grains of material in the tailpipe during preflight (see page 44). The material appeared to be grains of sand which could have been blown into the tailpipe but, not content to make this assumption, the pilot summoned a maintenance chief who downed the aircraft for further investigation. By holding a magnet over the material, it was found to be metallic in content. Further investigation revealed numerous fine cracks in hot section components.

Had this pilot been a little less careful on his preflight, there is a good chance that a fire or explosion would have occurred during the subsequent flight.

The Role of Maintenance Personnel

Maintenance personnel can do their parts to prevent inflight fires/explosions by:

- Recognizing (and giving particular attention to) those aircraft discrepancies which have a potential to contribute to an engine failure, fire or explosion.
- Referring to appropriate technical manuals when performing maintenance functions, particularly those which involve disconnection, routing, clamping and reconnection of fuel, oil and hydraulic lines and fittings.
- Performing all required functional checks after maintenance work is performed.
- Making careful preflight and postflight inspections of aircraft.
- Insuring that quality assurance inspections are conducted at every appropriate stage of maintenance work.

To sum up, fires and/or explosions are involved in a significant number of major accidents. Prevention of some fires/explosions may be beyond the scope of individual pilots and maintenance men but *some are not*. Many can be prevented by careful maintenance work and inspections. Finally, if worst comes to worst and an inflight fire/explosion does unavoidably occur, the hazards can best be minimized by pilots who are well-versed in NATOPS emergency procedures and execute them promptly.



DEFENSIVE DRIVING

DEATH on the highways continues to be the number one killer of Navy personnel – about 500 annually. Sadly enough, it is usually because the discipline and safety practiced by these individuals when performing their military duties is forgotten when they slide behind the wheel of an automobile. To help Navy folks retain some of their self-control on the road, the Navy has established a Defensive Driving Program.

Responsibility for administering the course, which was developed by the National Safety Council, has been assigned to the Chief of Naval Operations (OpNav 5100.8A). His office has in turn provided Naval District Commandants with course kits in numbers proportionate to the ship and shore stations within his district. Started in June 1969, the course is intended to eventually reach all Navy personnel.

The National Safety Council has already administered the eight-session, eight-hour course to 1.5 million drivers. Material covered is based on 50 years of accident prevention experience and consultation with the motor transportation industry. Topics of study include *Preventable Accidents, Avoiding a Collision With the Car Behind, Avoiding a Collision With the Car Ahead, Avoiding an Intersection Collision, The Art of Passing and Being Passed,* and others. A student workbook is provided, supplemented by an instructive text for driver's license applicants from the state in which the course is being taught.

Instructor training is one of the most vital aspects of the Navy program, and some commands are conducting a 12-hour instructor qualification class in addition to the 8-hour course.

For the Navy the Defensive Driver Course means driver education on an adult level. In most cases it also means trying to correct established bad habits and apply unpracticed good ones. Neither job is easy. Hopefully, however, it will slash the Navy's auto accident rate to a level commensurate with its generally effective on-the-job safety program. ◄

"The defensive driver is neither timid nor overcautious, but he is determined to take every reasonable precaution to prevent traffic mishaps, over and above what the law requires him to do."

National Safety Council

Cross-Country Flights

FROM: TRAINING OFFICER
TO: ALL PILOTS

SUBJ: CROSS-COUNTRY FLIGHTS, GENERAL INSTRUCTIONS

1. Pilots participating in cross-country flying will assume all responsibilities in a manner which will reflect the superior knowledge and extraordinary skill of the typical CRT aviator. Proven guidelines to accomplish this are as follows:

a. Any aircraft with an operational compass may serve as a cross-country aircraft. Charts published prior to 1936 are not considered reliable and should not be used. In case you get confused during your flight; Virginia is green; Maryland is brown; North Carolina is yellow; South Carolina is red; and Georgia is tan on your TEXACO MAP.

2. If you become surrounded by lostness, land at nearest airport – DO NOT ASK where you are – Ask directions to nearest men's room! Display confidence – smile at everyone! Read your location on front of hangar or line shack and proceed on your route.





3. Be a few minutes late to all briefings. This will assure the Briefing Officer that you are no amateur and that you have attended many such sessions. Ask several elementary questions to be sure the Briefing Officer is competent. Make witty remarks throughout the meeting to leave no doubt in his mind that you are not merely a "hot-rock" but that you are a "smolderin" boulder – Senior Grade.

4. Have the Pro-Line personnel carefully describe your aircraft to avoid takeoff in the wrong machine.

5. At takeoff time, approach the aircraft in a reckless, devil-may-care manner, as this makes a big impression on bystanders. Do not trip over the power cable, as this *doesn't* make a big impression on bystanders. Ask the nearest lineman what type aircraft it is – just to make sure!

6. Conduct your preflight in a rapid but deliberate manner. Check all fuel tanks to see that all air has been removed therefrom. Be sure to kick vigorously at all the tires. When you come to a complicated part of the airplane, stare at it seriously for several seconds before

going on. This creates a favorable impression on the line chief and makes the bystanders think you know what you are doing.

7. When you have finished the preflight, see where the APU and line crew are located, then proceed rapidly to your *assigned* aircraft and repeat steps 5 and 6.

8. To enter the aircraft, approach it from the left side and leap lightly onto the wing without looking.



9. Pick yourself up off the ground in a casual manner and climb the steps onto the wing (Note: Try to control the tense feeling in your stomach and above all, don't look down!). Enter the cockpit in any manner you choose. If at all possible, avoid going in head first.

10. Next, check stick and throttle positions. If the stick is in your left hand and the throttle is in your right hand, you are in the cockpit backwards. Don't panic! Smile at the crew chief, wave to the bystanders and slowly rotate your body 180 degrees. Now rearrange all shiny, well-used switches, levers and buttons in the cockpit in a pleasing and eye-catching manner. Don't bother the dull corroded ones. Prepare to start the engine!

11. Upon starting the engine, advance the throttle smartly to military power and stand by for the crew chief's signal. When he begins waving to you, do not wave back. Rapidly rearrange the switches, levers and buttons, until the right combination is found – whereupon the crew chief will stop waving. (Note: In making magneto check, move ignition switch as rapidly as possible to obtain lowest drop in revs – and to prevent complete engine failure on inoperative magneto.)

12. When signal is given to taxi, advance the throttle smoothly, hit the "highblower" switch and jump quickly over the chocks. Retard the throttle to military power and try to avoid further use of highblower while taxiing as this irritates ground personnel.

13. When taxiing, an effort should be made to avoid collision with linemen, as this causes damage to the propeller – and creates an untidy condition on the ramp.

14. If, after turning out of your parking spot, you see a large gray wall, stop quickly, turn around and taxi back out of the hangar. You have committed a rather serious error.

15. After arriving in the general vicinity of the runway, immediately begin calling the tower at frequent intervals in a loud, authoritative voice. Do not take negative for an answer. This will accelerate the launching process. If you are on a downwind runway, take off anyway. This will demonstrate your self-confidence.

16. After leaving the ground, pull the nose up smartly, close your eyes and count to 10. If contact with the ground has not occurred by that time, continue the mission as briefed. (Note: You may open your eyes for the remainder of the flight, if you wish – however, this is optional.)



17. You may now relax and amaze yourself with your uncommon ability to perform incredible feats of aerial gymnastics. (Note: All pilots are directed to maintain a one-to-one ratio between takeoffs and landings.) Pilots found in violation of this directive will forfeit parachute privileges.

(STOLEN FROM CONFEDERATE AIR FORCE OP-ORDER 1-YR) ◄


130

You get no bread with one meatball!

By LT W. J. Mooberry, RVAW-120, LSO

IT'S gonna' happen to you some day if it already hasn't . . . You're on the platform in the very worst kind of weather. The seas are heavy. It's raining. It's cold and the rain is freezing just as soon as it hits the deck. You stand there, blowing on your hands trying to get some semblance of circulation back into your trigger finger, cursing John Paul Jones and waiting for the first airplane.

"We oughta get more money!" you tell the phone-talker. He tries to smile but looks a little green in the strange half-light of early evening.

Suddenly, there it is . . . an F-4 just out of the overcast . . . wagglin' his wings and blinking his approach light at you all the way down the slope.

"Be smooth," you tell him. "Don't chase the deck."

He drops his nose.

"A little attitude."

His left wing comes down!

"Wave off!"

There's a great roar and a flash of light.

You crawl out of the net and look over the side just in time to see two chutes entering the water. You watch as the big fighter rolls on its back and goes in nose first. As you look up, you see the scattered shards of your Fresnel lens blowing all over the flight deck; its power cables are torn and broken; they slap together in the breeze . . . arcing and sputtering.

Somewhere out there in that clag 25 more airplanes are milling about waiting for you to bring them aboard and your lens is *gone.*

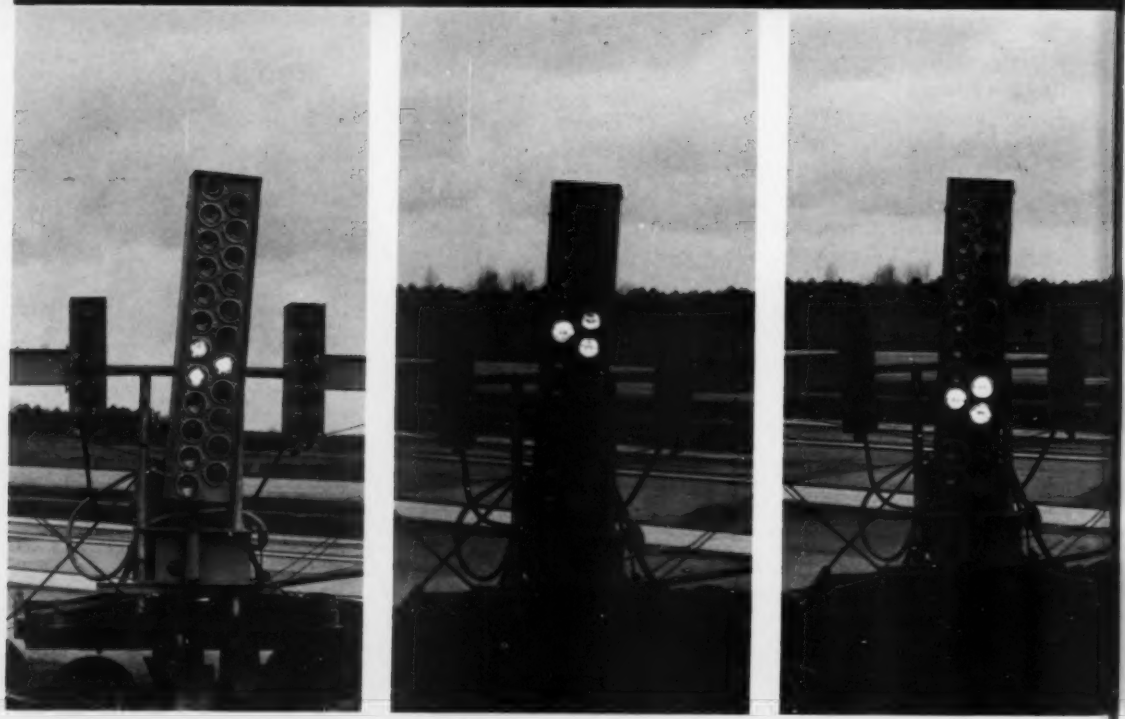
A metallic voice on the squawk box says, "Paddles, Primary. Rig the MOVLAS."

The prospect of bringing 25 airplanes aboard in marginal weather on a pitching deck in freezing rain at night with a mechanical meatball makes most LSOs shudder. But it shouldn't. And it won't if everyone in your air wing, *pilots and LSOs alike*, is proficient in the use of one piece of equipment vital to this chore.

Your equipment in this case is a silly little




CENTER
HIGH
LOW



acronym: MOVLAS (Manually Operated Visual Landing Aid System). MOVLAS, like the wedge, is a simple tool. Beautifully simple. And, while installations may vary slightly from ship to ship, its operation is equally uncomplicated. The LSO, by moving the handle of a wiper drum on the platform, controls sequential illumination of a five-foot-high column of lights placed in front of the permanent Fresnel lens installation. Illuminating these lights three or four at a time, when viewed from an aircraft and in relation to the datum lights, presents the appearance of a normal meatball. Moving the handle down progressively illuminates lights lower on the column and indicates a "low" to the pilot making an approach. The six bottommost lights are red and when illuminated present a red ball just like the bottom cell of the Fresnel lens. Moving the handle up causes a "high" ball to appear and indicates to the pilot his aircraft is above the optimum glide slope.

MOVLAS should be used whenever the validity of glideslope information is questionable; or, as pointed out above, whenever the glide slope is missing altogether. While missing slopes are admittedly rare, there are times when, in spite of the intricate lens stabilization systems we are equipped with, the stabilization limits are exceeded and MOVLAS is required. Even though most lens stabilization systems are advertised as being reliable through three degrees of pitch, common sense and experience tell us that neither pilots nor glide slopes are much good when one of those big iron hotels begins pitching more than a degree or so.

There are three choices available when facing any of the above situations as an LSO. You can bingo the air wing (this, while lightening your workload considerably, makes shipboard life a little lonely and tends to frost CAG); you can talk everyone down to a landing (if your heart can stand that kind of a horror show) or you can rig the MOVLAS, bring your whole flock safely home to roost and continue to enjoy the friendly joshing and camaraderie of wardroom life with your friends.

To refresh memories, the LSO NATOPS manual requires *all* LSOs to work *all* pilots a minimum of one full FCLP period with the MOVLAS prior to carquals. NATOPS further requires all LSOs to thoroughly acquaint themselves with MOVLAS and be proficient in its use ashore before using it aboard ship. And finally, NATOPS directs that one complete recovery per LSO, per month, will be made utilizing MOVLAS.

A keen eye will note there are no escape clauses in those instructions; no exceptions for *Phantom* Phlyers or *Stoof* Jockeys or anybody. Well, maybe bag pilots are exempt, but there aren't many of them left around anyway. Everyone else is tasked with the responsibility of maintaining proficiency in the use of MOVLAS.

During the research of this article one thing became clear from the start. When you talk to aviators and LSOs about MOVLAS there is no neutral ground. Both types either equate MOVLAS with some of the great inventions of our time (such as the hip flask and sliced bread) or liken it to a gamma globulin shot due to the sudden discomfort both produce in the gluteus maximus.

Emotion and rhetoric aside, however, the unfortunate fact is that most of us, paddles and pilots alike, are woefully ill-equipped and lack the requisite skills necessary to safely and efficiently conduct MOVLAS recoveries, even under optimum conditions.

Further investigation into this phenomenon of MOVLAS-aversion indicates those who are most vociferous in their objections are usually the least proficient in its operation. It's the old tried-it-once-and-didn't-like-it bit! LSOs, however, are duty bound to try it more than once. They are obliged by the instructions which govern the application of their peculiar trade to acquire and maintain skill in its use.

So how do we go about equipping all hands with the necessary knowledge to utilize MOVLAS properly and safely? Throwing inexperienced pilots and LSOs into a situation in which the use of MOVLAS is the *only* answer obviously would create one of the world's greatest FUBAR recoveries.

Surely the viewpoint of the uninitiated pilot is clear. He may have *heard* that a MOVLAS approach is flown exactly like a normal carrier pass, but with no training or experience in flying a mechanical meatball he can't be expected to display a great deal of confidence in the system. Don't ask him to blindly wager his chapeau, derrierre and mackintosh on an unknown quantity such as MOVLAS if he has not been maintaining his proficiency all along.

What can you, Paddles, expect when, after mucho years of relying on an impersonal, unemotional, gyro-stabilized, five-celled flashlight for glide slope information, you suddenly call for a mechanical meatball recovery and commence cranking on that pregnant bumper jack of a control box like you were changing tires on a six-by? Just so you won't be surprised, I'll tell you what you can expect; you won't get a bird any closer to the ramp than the delta pattern – that's what you can expect.

Conversely, an LSO who has acquired and maintained a proficiency with MOVLAS will tell you that it can add a completely new dimension to this carrier landing business. No longer is the LSO merely a semi-passive commentator on the passing parade. Suddenly he has direct control of the aircraft hurtling themselves down the glideslope at him. And, in this world of automatic,

all-weather, electronic airplanes that beep and twitter and hum and make all their own corrections on the glide slope, the big guys say it's just like waving paddles!

Like paddles, MOVLAS requires something of an extra ingredient to be a complete success. It requires a confidence – a trust – an unspoken bond between pilot and LSO. This rapport is not dispensed in an aerosol can, however. It is acquired only through training and happens only after pilots and LSOs come to trust the system and each other. A seasoned air wing, skilled in all facets of the profession, will have acquired this trust through practice.

While no one is foolish enough to claim MOVLAS is a panacea for the multiple problems associated with landing airplanes on boats, it is important to realize that in situations when ships have been forced to rely on this backup system as their primary means of recovering aircraft, (and have been trained accordingly) their boarding rates have *increased* appreciably. *Very* interesting – – – .

As good as the idea is, however, MOVLAS is only as good as the guy with the crank in his hand. And even though he be the greatest LSO since Black Jack Maroone turned in his pickle, he must contend with some exasperating equipment limitations. For instance, today's MOVLAS will not allow LSOs to move the ball off the top of the light box. Thus, an aircraft may be at 900 feet through the 45 and the pilot still sees a ball. Of course any LSO worth his salt can rectify that situation by simply growling gently, "Get it down in the middle, pal!"

Still more troublesome is the fact that MOVLAS recoveries often become a two-man evolution on the LSO platform because Paddles is forced to estimate the ball's position in relation to three detents in the wiper arm track. Thus if the ball is anywhere except extremely high, centered or extremely low, he either has to guess at its true position or else have an assistant constantly announcing the position of the ball since the controlling LSO is always facing away from the light box.

NAEC is currently working on this problem and expects to begin installing a direct reading visual repeater within 12 to 18 months which will actually be kind of a "mini-MOVLAS," mounted on the platform and visible to the controlling LSO at all times.

It is important to realize that while CVA-CVS NATOPS considers MOVLAS to be emergency equipment it does not prohibit its use under normal recovery conditions for training purposes. MOVLAS recoveries must be practiced for the same reason all other emergency procedures must be practiced. Turning your back won't make emergency situations go away and some day you may be forced to rely upon acquired basic motor skills to save your or someone else's rump. Engine fires, hydraulic fires and stall/spins won't disappear simply because you refuse to recognize they can occur and fail to prepare for them; neither will lens failures.

And just as sure as you're sitting there, some rainy afternoon 27 blue shirts are going to drop a scooter right on top of your lens; or somebody's going to leave an empty sardine can or a great big galley spoon right in the middle of the main lens stab gear drive and it's going to sit there and grind itself into delicate iron filings. Just as soon as that happens the air boss is gonna' call you up on his magic box and ask all sorts of pointed questions about your MOVLAS capabilities. And you're sure gonna' feel awful stupid if you don't know which direction to crank the handle on that funny looking golf-ball washer . . . ain't cha'?

Don't wait for a disaster, be ready with MOVLAS. One meatball just isn't a very healthy meal!



Feather No. 4

COMPOUND emergencies infrequently take place but when they do, and the crew successfully copes with them, they are very interesting and gratifying to relate.

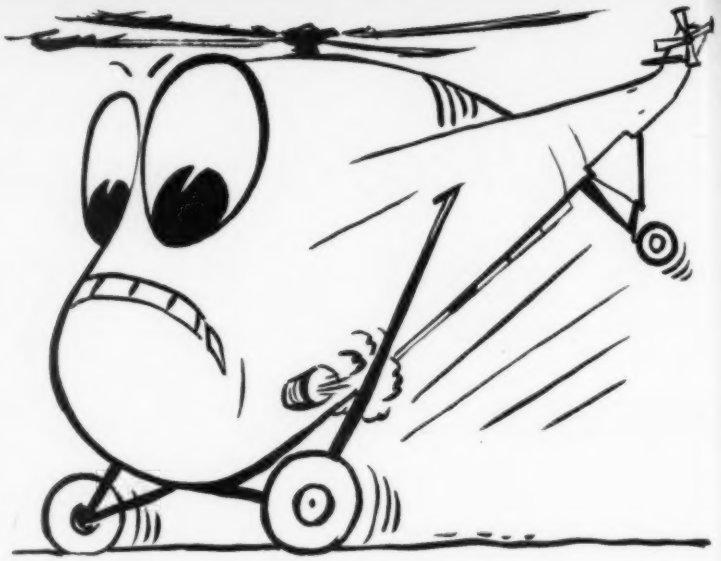
An incident occurred one winter day out over the Gulf after takeoff from an airport in the second largest state. Departure of the WC-121N had been routine and initial climb to cruise altitude of 9000 feet had been accomplished without any sign of trouble. About an hour and a half later while flying in rain (outside temperature -1^{0}C) the flight engineer applied carburetor heat. Both pilots and the flight engineer became perturbed when the preheat door on No. 4 engine stuck in the full hot position. Power on No. 4 was reduced and the cowl flaps opened in an effort to keep the engine on the line, but this did not help. As the carburetor air temperature gage went above 60^{0}C the engine had to be secured and the prop feathered (now on three). By this time the pilot had already decided to return to the nearest military airport which just happened to have the best weather conditions south of "Big D" and east of Laredo (400 foot overcast, visibility 1 mile in rain, winds 020/18+36 – good ole Texas norther). While enroute to the divert airport fuel was being dumped to get down to safe landing weight but the number 2-B tank would not dump. Dumping was secured – except that number 3-B tank wouldn't stop dumping and the dump chutes for tanks 2 and 3 wouldn't retract. Emergency fuel dumping was attempted but with no success. If that wasn't enough trouble, the pilots and flight engineer noted a loss of secondary hydraulic fluid, but they solved this by placing the *fuel dump lever* in neutral. At the same time the dumping problem and secondary hydraulic fluid problem were being attended to, the No. 3 engine developed a fluctuating BMEP with indication of a bad fuel combustion pattern in No. 13 cylinder. (For you turbine types, that isn't good.)

The pilot declared an emergency. All of the fuel tanks except 2-B had dumped to the standpipe level and tank 2-B still contained 300 gallons which was slowly transferring. The big plane was still overweight for landing. On arrival at NAS the pilot was vectored into a holding pattern while the fuel in tank 2-B was slowly transferred. (Weather had deteriorated to a 300-foot overcast, visibility 1 mile in rain and fog, winds still 020/18+26.) After half an hour in the holding pattern the aircraft was finally down to landing weight and the pilot attempted an ASR approach to the northwest runway. When the aircraft broke out at minimums, the runway lights were not on, contrary to the pilot's request, and lineup was too far left to permit landing. Thus, a waveoff. (No. 3 was still operating.) The pilot then decided to attempt a GCA to the northeast runway – into the wind but only 4000 feet long. His second approach was begun as GCA advised that the weather was 200 feet overcast, visibility ¾ mile in rain and fog. Again the pilot had to take a waveoff because of left lineup. The third approach was successful and after touchdown the pilot reversed No. 2 and No. 3 engines to help stop on the short, wet runway. The aircraft was stopped on the runway and by the time yet another secondary hydraulic fluid leak began, everything was secured and gear pins inserted. The Super Connie was then towed to the transient line and parked.

Investigators could not discover any reason for No. 4 engine's carburetor preheat door sticking open. But they did find that hydraulic lines to the 2-B fuel tank dump chute were disconnected and the BMEP drop on No. 3 engine was caused by a malfunctioning fuel injection nozzle.

The C.O.'s comments were, "This incident offers vivid testimony that every aviator and flight crewmember must be highly trained, completely qualified and must be physically and psychologically prepared for every flight." *Ver-ree in-ter-resting!* ◄

Watch Those Habit Patterns



A STUDENT of mine with about 80 hours in type surely taught me a lesson one day. It wasn't in the syllabus and he didn't brief me before it took place. However, I'm sure that as a result we both learned that nothing similar will ever catch either of us off guard again.

It involved a broken habit pattern and instead of bells ringing, lights flashing and the TILT sign illuminating he blithely went about his cockpit duties while I, the instructor, almost waited too long to prevent a bird from getting bent. The student had completed all checklists prior to liftoff but because the engine had backfired earlier, I asked him to perform another mag check. He completed the additional mag check, which was normal, and then let go of the cyclic stick as he reached over to turn on the ASE. He forgot that the collective was UP and the engine was putting out a lot of horses. As he let go of the cyclic the helicopter tilted forward (brakes were locked). I grabbed the cyclic and was able to pull it back despite forward trim on the stick and the student's delayed resistance to my input. The helicopter balanced precariously on the main gear and came within inches of falling over on its nose. (I'm sure the only thing that saved us was me holding my breath.)

Breaking a student's habit pattern possibly would be good to do once in a while but if done, instructors must be prepared for *anything*. It should be reemphasized to all helicopter pilots – never let go of the cyclic. It could wreck your whole day.

Helo 'Structor Mouse

Manufacturers of helicopters put in all kinds of sophisticated systems, subsystems and other good things for one of two reasons; to reduce human effort or increase safety. In the latest models where you don't have to keep both hands and both feet on the controls all of the time the door is wide open, if der thinknoggin goes kaput, for just such a happening as this. You instructors can not afford to relax the 3-Gs (guide, guard and guts) at any time.

I Could Kick Myself

AS I returned from a night instrument flight, I was cleared for a tacan penetration to a runway where FMLP's were in progress. Upon reporting the gate I was instructed to take interval on an aircraft at the ninety. The interval was close and a seven knot crosswind was blowing but I figured I could make it. The aircraft ahead was waved off by the LSO and just as I crossed the threshold my left wing dropped about 30 degrees. Although I added military power and was able to almost level the wings, the aircraft touched down on the left main

ANYMOUSE

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

wheel, nosewheel then right main wheel (in that order) before I could get airborne again. Fortunately, no damage was done.

The wing drop was caused by jet wash but I still can't figure out why I let myself (with over 2700 hours) get into such a stupid predicament. Overconfidence, complacency – or just plain stupidity – must be the answer.

Vigilante Mouse

We hesitate to argue with you because your report does show that even the most experienced aviators must constantly fight the tendency to lapse into complacency.

Watch Where You Taxi

THE below near-accident occurred while on a recent deployment to MCAS Far East.

The crew of an EC-130Q was at the turnup spot for the duty runway. Engine runup had been completed and the aircraft commander in the right seat was reading the checklist. About halfway through the checklist a P-3, waiting behind the EC-130Q, called for takeoff clearance. The time was 0430 local and it was quite dark outside. The P-3 was given instructions to taxi into position, cleared for takeoff and told to contact departure control prior to roll. The P-3 proceeded to taxi toward the huge EC-130Q. The aircraft commander in the right seat of the C-130 thought that the P-3 would stop because there was not room for it to get by, but the P-3 kept coming and at a good pace. The C-130 aircraft commander then realized that the P-3 crew didn't even know he was there. He started yelling over tower frequency, "P-3 stop, P-3 stop, stop †+$%*&! You can't get through." About this time the crew in the P-3 were either awakened or aroused from their somnolence and the pilot of the P-3 jammed on the brakes. It stopped about two feet short of the nose of the EC-130Q. This could have ruined a good day and a pilot's career.

ASO Mouse

It could have ruined a couple of good aircraft, too, not to mention the possibility that some of the aircrew might have been injured. This near-accident should have been prevented by a tower-issued warning when the P-3 was cleared for takeoff, e.g., "Caution the C-130 in the warmup spot." It could have been prevented by an earlier warning from the EC-130Q crew – and most important, it could have been prevented if the P-3 crew had visually inspected and cleared the area ahead of them. We assume that the EC-130 was showing some lights and that the P-3 crew had their heads buried in the cockpit. In any case, nights don't get dark enough to justify taxiing into anything as big as a C-130.



Hold Down the Noise . . .

AN AIRCRAFT CARRIER and the ship to which I am assigned (a DD) were playing leapfrog, with the carrier making approaches on the destroyer. On the second approach, as the carrier came alongside, one of her aircraft was turned up. The noise level on the destroyer was deafening while the aircraft engine was being turned. I was standing on the destroyer's main deck as an observer and attempted to talk with one of the other officers. I could not hear my own voice, much less anyone else's. In later conversation with other shipboard personnel I learned that:

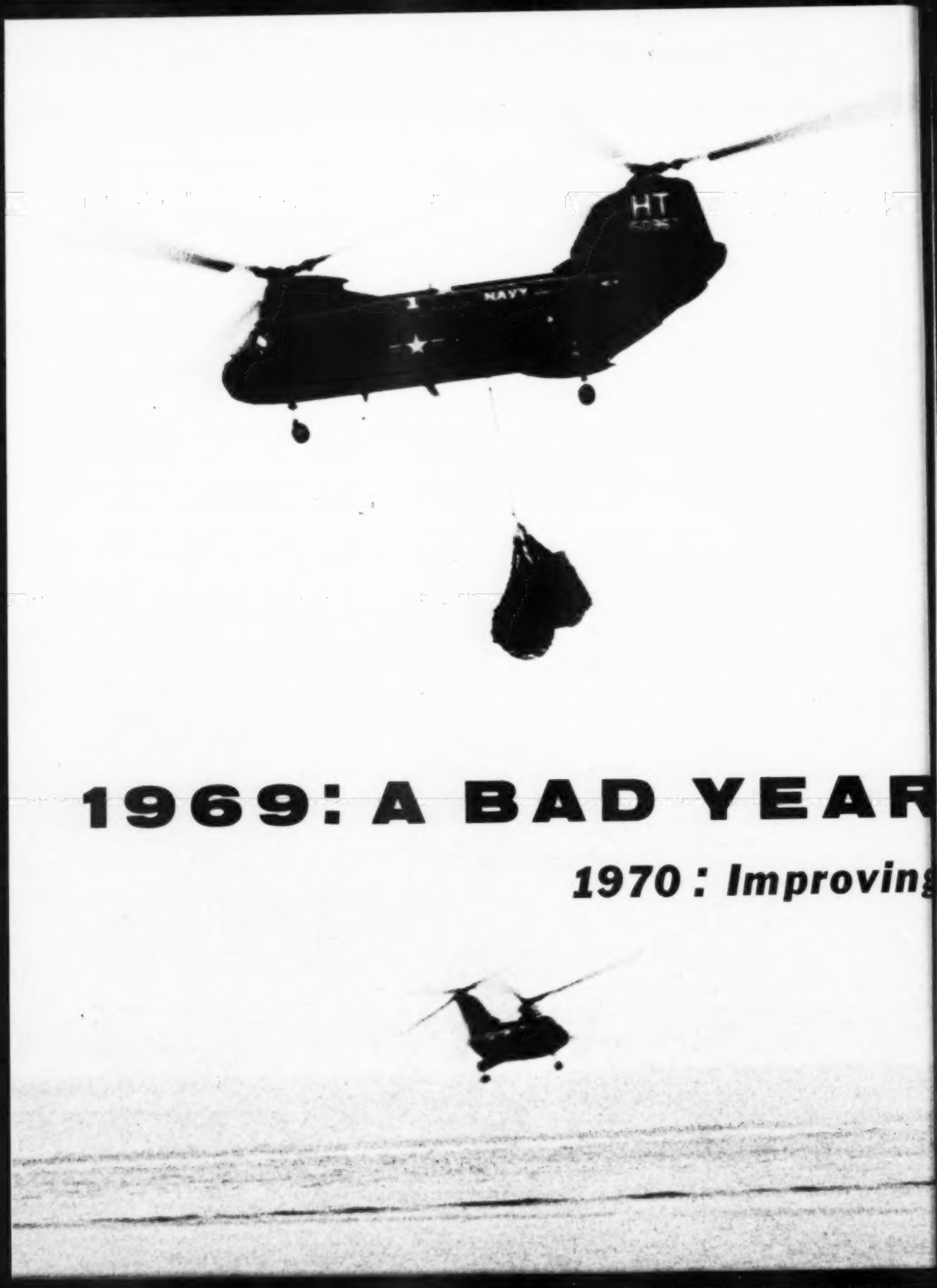
- The bridge watch was in the process of being relieved.
- No one on the bridge could hear anything above the roar of the jet engine.
- CIC personnel (and engineering personnel in the holds) could not hear any sound above the noise of the engine being turned.

In essence, the ship was "deaf" while the carrier was alongside. Had we experienced a steering casualty, loss of electrical power, received a tactical message over the radiotelephone or had any other sort of action situation arise, the ship's capability to respond would have been grossly degraded because no one would have known what was happening (too much noise).

I believe aircraft carriers should have rules against turning aircraft engines in close proximity to other ships.

Ship Mouse

It is possible that effects of the aircraft turnup were not recognized by the carrier OOD. In any case, you certainly have a good point. This area of potential hazard will be the subject of a forthcoming article in the Weekly Summary. ◄



1969: A BAD YEAR

1970 : Improving

IN THE helicopter community there is something wrong and the time to ferret out the reason is now. One problem is this: CY 67, 68 and 69 have had higher overall accident rates than 66. In addition, the helicopter accident rate has been appreciably higher than the fixed wing rate (e.g. helo rate 1.83, fixed wing rate 1.35 in CY 69). More cause for concern is the rising number of pilot-caused accidents in helicopters. Why? Let's analyze some of the differences in flight operations between helicopters and fixed wing aircraft. It could be that helicopter pilots are *exposed* to more dangers. The ASW helo pilot who spends the majority of his time dipping below 75 feet at night is *exposed* to more dangers than his ASW fixed wing counterpart who has the advantage of an extra 200-400 feet of altitude. The vertrep helo pilot who spends about half of his time keeping his rotor blades out of antennas, masts, king posts and gun barrels is *exposed* to dangers that fixed wing pilots never experience. The SAR helo pilot, particularly on overland SAR flights is *exposed* to more dangers at treetop level than fixed wing SAR pilots. On the other hand, helicopter pilots do not have to operate on the ragged edge of controllability as swept wing jet pilots frequently do. Rotary wing pilots enjoy an infinite advantage in landing aboard ship; in fact, in landing anywhere – ship or shore. Helicopter pilots are able to land and take off in most wind conditions without worry about crosswind. You just can't beat no drift and zero ground speed for full, positive control during landings and takeoffs. Perhaps in the light of these points accident potential is less to pilots of fixed wing aircraft when in flight, but during the critical phases of landings and takeoffs the helicopter pilots have the dubious advantage.

Looking Back

Fifteen years ago, in the heyday of the HTL, HUP and HRS, helo pilots flew without flight instruments or at best with only a couple of inadequate gages. These aircraft operated without stabilization equipment or any control boost systems and power plants were modified tank engines or aircraft engines adapted for use in helicopters. Communication equipment in these helos was pretty sad. Standardization was something just talked about – after a pilot finished HTU-8 (helo training) he rarely did things the same way twice. Operational procedures were determined on the scene, i.e. if a pilot thought he could hack it, he tried it. As a result, the accident rate was sky high. HU squadrons had a good year if they had only 15 accidents. We've come a long way since then. The bitter lessons, learned in the toughest of ways, have resulted in tremendously improved hardware, development of NATOPS procedures, better facilities ashore and afloat; improvements in nearly every area except one – human performance.



Know the wind direction for approach . . .


hover . . .


and cargo drops.

Facts, Figures and Explanations

To develop this article, the NavSafeCen data bank (computer) was programmed to report all major helicopter accidents during calendar year 1969. Fig. 1 shows the number of accidents by helicopter model,

CY 1969 MAJOR ACCIDENTS CY 1969

	Number	Rate/10,000 Hours	Accident Damage
H-1	33	3.03	18A/15C
H-2	9	2.74	6A/3C
H-3	8	.90	5A/3C
H-34	13	1.28	9A/4C
H-46	26	1.67	17/9C
H-53	8	2.06	6A/2C
Total	*99	1.83	61/36C

*Includes two H-19 accidents not shown.

Fig. 1

Model	Mishap Type	Phase of Operations	Primary Cause
H-1	11 Sys. Malf. 7 Collision 4 Hard Landing 1 Stall/Spin 1 Abort Takeoff 9 Miscellaneous	12 Inflight 9 Takeoff 8 Landing 4 Auto	19 Pilot 12 Material 1 Other Pers. 1 Undetermined
H-2	3 Sys. Malf. 2 Collision 1 Airframe Fail 1 Hard Landing 2 Miscellaneous	8 Inflight 1 Auto	2 Pilot 3 Material 3 Other Pers. 1 Undetermined
H-3	2 Sys. Malf. 2 Collision 2 Airframe Fail 1 Collapse MLG 1 Fire	6 Inflight 1 Takeoff 1 Static	2 Pilot 6 Material
H-34	3 Sys. Malf. 4 Collision 6 Miscellaneous	10 Inflight 3 Landing	4 Pilot 7 Material 2 Other Pers.
H-46	8 Sys. Malf. 11 Collision 2 Airframe Fail 5 Miscellaneous	13 Inflight 5 Takeoff 5 Landing 2 Static 1 Auto	13 Pilot 9 Material 1 Other Pers. 3 Undetermined
H-53	1 Sys. Malf. 4 Collision 2 Fire 1 Miscellaneous	5 Inflight 3 Landing	3 Pilot 2 Material 1 Other Pers. 2 Undetermined

Fig. 2



Beware of icing in clouds.

accident rate for each model and classification of damage; (two H-19 accidents were not included since there are none of this model left in the inventory.) However, as the figures indicate, there is more than enough to think about; 97 major accidents, 61 of which resulted in destroyed aircraft and the remainder resulted in substantial damage. That is one big batch of bent/broken birds! The ridiculous fact is that despite advancement in the state-of-the-art, better equipment and improved training, 1969 was one of the worst years in recent helicopter history.

So much for mere numbers. Let's quickly move on to the kinds of accidents that occurred, the flight phases and the causes for occurrence. Statistics shown in Fig. 2 are not completely accurate since in some accidents there were multiple factors and the table shows only the primary cause factor. In the column *mishap type*, the category title *collisions* includes collisions with anything – other aircraft, poles, antennas, ground and water. The column titled *phase of operations* contains information that indicates what the helicopter was doing when the mishap occurred.

However, there is a point which stands out in the column *primary cause*. It is startling to see that 43 accidents were assigned pilot causes. (In the article, "Today's Chopper Problems," March 1969 issue, it was pointed out that pilot-caused accidents comprised only 36 percent of the total. This article also indicated that

real dividends would accrue if we could improve human performance in the cockpit and also proposed closer adherence to NATOPS, continuing training and closer supervision as three fertile areas for investigation.) Fig. 3 has been prepared to illustrate specifics of pilot-caused accidents. Of the 43 pilot-caused accidents shown there were usually multiple pilot errors involved. In other words most pilot-caused accidents were caused by more than one error in technique or judgment – a single "goof" was rare, it was usually compounded. Going beyond the accidents, let's further separate the causes into two classes – technique and headwork. Poor technique, where the mechanics of flying the bird (training) were deficient, resulted in 35 accidents and poor headwork was responsible for eight more. All 43 pilot-caused accidents could have been prevented. So it follows that the number of accidents in 1969 could have been greatly reduced. No sermon with a text from the gospel according to NATOPS has been prepared, but we do present some ideas for consideration.

Continued



Angel, FOLLOW the aircraft in the groove.



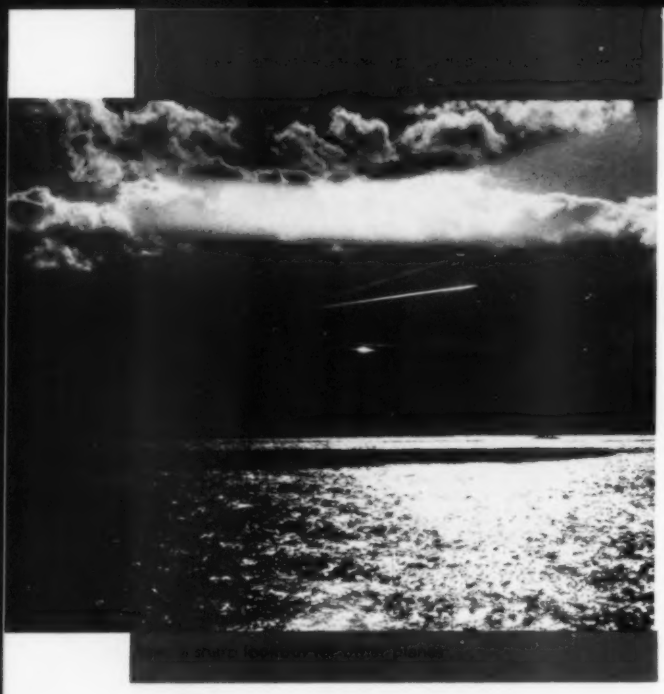


Rotor tip vortices are dangerous . . .

Pilot-Caused Accidents

Mid-air/collided with objects	10
Excess sink rate (usually autorotations)	6
Lost rotor RPM	6
Flew into the water	5
Downwind approach/takeoff	3
Overload	2
Collision with object during air taxi	2
Gear/skids dug in during turn	2
Engine failure; secured good engine	2
IP/pilot too slow to correct student/copilot	2
Blade stall	1
Improper use of controls	1
Disorientation	1

Fig. 3





A Few Ideas

If time, manpower, airframes and money permitted, we could double or triple the length of helicopter training at Ellyson Field to ensure that rotary wing pilots knew more about helicopter flying before graduating. We could crack down hard on written and flight tests to improve the knowledge of each graduate before he goes to the fleet. But would we really get a better product than is now turned out? No marginal or average pilot would get by. Everyone would be "above average" and "average" would be unsat. Since increasing the training time to this extent is impractical, what portion of this plan might work? Constructive criticism from operating squadrons, concerning the capability of training command graduates might be one. No one in this world knows more about the product coming out of Ellyson Field than fleet operators. Realistic suggestions received from fleet squadrons could be put to good use by those who train the students.

What about helicopter RAGs? We have operational pilot training for some models but not for all. Furthermore, RAG training isn't constant between coasts. The fixed wing community is fairly well locked into this concept in VF, VA, VS and VP but the rotary wing group is not. We do have HS RAGs and the West Coast has a formal HC RAG, but that's about all.

Another possibility exists in combining operational and training functions within each squadron. It's done to some degree already. For instance a standard ground and flight syllabus could be developed for each model helo. Each operational squadron, using this syllabus, could be its own RAG for a particular model. Staffing could be accomplished by split-tour pilots, i.e. instead of being transferred, fleet pilots could crossdeck, so to speak. Then they would be removed from operational status but remain in the squadron for instructor duty.

Thus far we've discussed operational pilots and how to enhance their training. One other training job needs to be performed. How do we train the pilot who comes ashore from a fleet squadron experienced in one model helo and is immediately assigned to SAR duties in a model he's never flown? There seems to be an assumption that a helo pilot is a helo pilot in any rotary wing aircraft. This is no more true than to assume that an F-4 pilot going to shore duty is qualified to strap on a TA-4 for CRT. In either case it doesn't take long to cross train individual pilots but it does take *some* time for training and it should be formal training – both ground and flight.

A cursory look at the state of helicopter health in 1970 is slightly encouraging. Although the year is less than one-half along there are indications that improvement has begun and that pilot-caused accidents will be reduced. It doesn't take much – just professional pilots knowing their procedures, their aircraft and themselves, then operating within safe parameters.

Success depends on headbone and backbone, not wishbone and tailbone.

It Just Wasn't My Week!



Monday they said I 'most creamed my plane,
(A bit of a brake in a little old rain?)
Sometimes the whole world gives me a pain!

It just wasn't my week!

Tuesday I heard from the NATOPS crew,
They say my exams are long overdue,
Now how in the world could that be true?

It just wasn't my week!

Wednesday, indeed, was filled with woe,
The beach chicks squawked I was flying too low,
The exec says quit that or out you go!

It just wasn't my week!

Thursday I'd really rather forget,
I can see the plane captain's face even yet,
I didn't have *time* to strap on my jet.

It just wasn't my week!

Friday was bad as a week-end beginner,
I don't weigh too much – who wants to think thinner?
The doc says I have to cut down on my dinner.

It just wasn't my week!

And Saturday was the worst day of all,
Carrier decks are just built too small,
They say that it's me – I'm not on the ball.

It just wasn't my week!

So now it's Sunday and here I sit
Up front the chaplain's doing his bit . . .
Why did everyone get into a snit!

It just wasn't my week!

One thing bugs my sharp mind, however,
Behind all this mess could there be pilot error?

I don't think so – not me!
Any fool can plainly see –
It just wasn't my week!

THE ordeal began as a result of a collision on the flight deck during a bolter by an S-2. Damage sustained by the wing and aileron caused serious restriction to lateral control; the Tracker could not be held on glide path during the series of approaches that followed. Now, under maximum stress, with fuel running low (alternates had been out of range from the start) the pilot was faced with a night ditching.

" . . . After opening all overhead hatches and locking our harnesses, ditching preparations were complete. I began a descent from 500 feet, slowly reducing my airspeed and rate of descent. I did not want to reach a low airspeed too soon because we had trouble earlier keeping the wings level. The entire approach was completed on instruments; there was no visible horizon. At 200 feet the airspeed was approximately 100 knots with a descent rate of 200 feet per minute. To keep the wings level, my copilot maintained full left aileron while I handled the elevator and held the wings level with rudder. Final power adjustments were made and the throttles were not touched during the remainder of the approach. The main instruments used were the VSI, radar altimeter and compass.

"Approaching the surface of the water the airspeed was back to 90-95 knots with a very small rate of descent. As we descended below 20 feet I saw water glinting, then some part of the aircraft struck the water – probably the tailhook. It seemed like forever; then the aircraft hit with a terrifying sound and everything went black. There seemed to be one long deceleration, although other crewmembers recall more than one. When the aircraft stopped the water level was about halfway up the windscreen, but little or no water had come in through the overhead hatches. As far as we could tell the aircraft did not break up at all.

"When I attempted to move my legs I found that something (possibly a nav bag) had come forward and jammed between my leg and the center console. By this time my copilot was halfway out of his hatch. I released my harness and had to slide into the side window bubble to free my leg. Then I scrambled through the overhead hatch where I found the two crewmen on the aircraft and the copilot in the water near the starboard engine. When I asked whether anyone had released the main life raft I was told 'negative,' so I reached back into the cockpit and pulled the release handle, simultaneously sending both crewmen back to the hatch in case the emergency release did not work. When the men reached the liferaft compartment they found it to be partially open and that raft inflation had started. The three of us pulled the raft away from the hatch and cleared the HF antennae just as the copilot yelled from the starboard side to clear away from the aircraft because it was sinking. One man jumped into the raft on the port side; the other crewman and myself went to starboard, and with that the copilot got into the raft. Because of darkness we were unable to see the other crewman until he turned on his strobe light, although he was less than 10 yards away.

"Once settled in the raft, we checked for injuries; barring a few scratches, everyone was OK. None of the crew took their seatpacks out with them. It is squadron procedure not to connect the seatpack to your mae west in case the pack gets caught up. We noticed that a smoke float was burning not too far away. Two smoke floats were carried on this trip but the starboard one was knocked off on the flight deck. We felt extremely lucky that no fuel or oil had ignited.

"The plane guard destroyer hailed us almost immediately and was close enough that we could shout back and forth to the crew. A boat from the destroyer picked us up shortly and took us alongside, from which position we had to use a scramble net to get on board. This net – difficult to climb under normal conditions – was a hairy experience for us at this time.

"I am convinced that the ditching drills carried out in the squadron enabled us to abandon our aircraft so quickly and safely."

We are grateful to this pilot for the report of his experience. In the light of reports such as this, pilots and their crews can critically search out and correct flaws in their own procedures. ◄

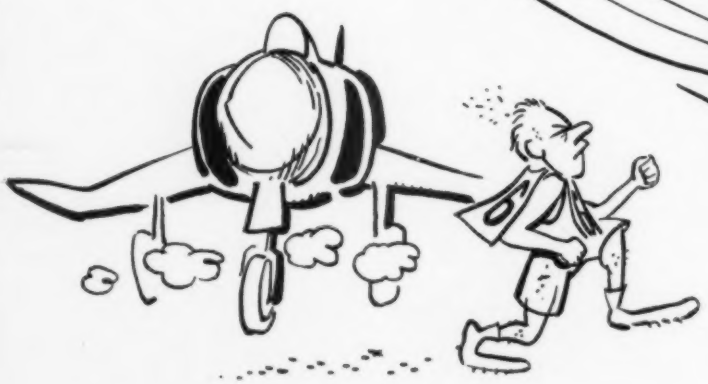
MORE GAMES

I'M A FLATHATTER SUPERB
sometimes known as Flat Header



GET UNDERNEATH IT EXPERT
or The VEEFR Who Should Be IFeR

Our thanks and a tip of our hard hat for this new collection of games that pilots (sob) play go to MAJ S. E. Field, USMC, ASO, 2nd MAW, New River, Jacksonville, N.C.



FLASH PREFLIGHT
or The Errant, Erratic Controlless Wonder
(one performance only)

FAST FLYING, LOW TUDE
sometimes p extinct

SPILOTS PLAY



WHEREFORE WER'T THOU, NOMEX?
or No, Ma'am, I'm Not A Hockey Goalie!

OW TUDE BEACH RUNNER
es p extinctus fastus

Forecast Surface Winds

TRUE OR

SOMEONE in the aviation community once uttered a sage bit of philosophy to the effect that what you know can hurt you, but what you don't know can kill you. In the accident about to be discussed this almost proved to be a truism.

Two A-4C pilots filed an IFR formation flight plan to a destination airfield with forecast surface winds of 350 degrees at 18 knots, gusting to 25. They computed that their crosswind component would be 12 knots with gusts to 16 knots (landing was planned for runway 03). Their preflight preparations included an extensive review and briefing of crosswind landing techniques, particularly stressing retraction of flaps immediately after touchdown. However, *neither pilot was aware that the forecast surface winds were given in true compass degrees rather than magnetic whereas the runway heading is always in magnetic degrees.*

Therefore, they did not subtract the required 15 degrees variation to obtain the actual magnetic direction of the wind at destination. This lack of knowledge resulted in their determination that landing conditions would be within the A-4C crosswind limitation. In actuality the conditions were well in excess (16 knots gusting to 22 knots) of the 15-knot NATOPS crosswind component limitation. Had the pilots known how forecast winds are given (true or compass heading) it was felt that they would not have elected to make the flight, either canceling out or selecting another destination with better winds for landing. It is of interest to note at this point a quote taken from the investigation and analysis section of the AAR:

> ". . .In defense of both pilots it should be reported that *each of the aviator members of the Accident Board also believed that surface winds are reported in magnetic heading.* In addition, the Board randomly sampled a large number of other Naval Aviators and found that very few of those sampled concerning this fact were aware that winds reported by weather offices are in true direction . . ."

However, the fact remains that the flight was made. Upon arrival at destination the flight leader executed a tacan approach, reported field in sight and was cleared to land on runway 03. This runway had 10,000 feet of usable runway available. At this time a left crosswind condition existed of 45 to 50 degrees with winds of 20 to 22 knots. The tower also advised that runway 35 (5,710 feet) was available if desired. The pilot chose to land on the duty runway because he felt he was more capable of successfully landing in an adverse crosswind than on the shorter runway.

Touchdown was made on the left side of the runway and full left aileron was applied into the wind with full forward elevator to keep the nosewheel firmly on deck. When the pilot reached for the flap handle he missed it

and had to divert his attention inside the cockpit to raise the flaps. When his attention was again focused outside the cockpit, the aircraft had drifted right to the center of the runway and the left wing was coming up. He was unable to stop the drift. When it became apparent that the A-4 would depart the runway a waveoff was initiated. The aircraft continued off the runway across rough, unprepared terrain, across a concrete taxiway into soft dirt where the landing gear collapsed and the right wing separated from the fuselage. The pilot had reduced power when it became apparent to him that he would not become airborne.

About this time, with everything turning to worms, the pilot used the alternate handle and successfully ejected, suffering only minor bruises and abrasions. Ejection airspeed was believed to be less than 80 knots in some unknown amount of right wing down attitude. (He hit the ground very shortly after the opening parachute shock.)

There were a number of important factors brought out in the investigation by the Accident Board.

In analyzing the pilot's decision to land on runway 03 the Board concluded that at no time did he realize that the reported winds were producing a crosswind component in excess of the 15-knot limitation on the A-4. This occurred because he failed to compute the crosswind by using the crosswind component nomograph contained in the A-4 NATOPS Pilot's Pocket Checklist which was available in the cockpit. Instead he mentally computed that as long as the relative wind was not in excess of 45 degrees and 30 knots, the crosswind component was within limits. In his thinking he assumed that the component was a linear function of the angle when in fact a crosswind component equaling one-half of the wind velocity occurs at 30 degrees relative direction and rises sharply from that point. Had he used the nomograph he would have been aware of the excess crosswind and could have landed on runway 35, made an arrested landing or diverted.

It was also felt that the pilot erred in judgment in not recognizing the need for an immediate waveoff when he noted the left wing raising and his inability to control the right drift. The Board believed he would have been successful had he initiated his waveoff sooner.

Despite the fact that a successful ejection was made the Board concluded that he should have made an earlier decision to eject. "... the success of the ejection is self-evident, and the pilot should be commended for his rapid reaction once the decision to eject was made. However, the Board is concerned that another pilot in the same situation deciding to eject at the same point, might not have reacted as rapidly, with possible fatal results ..."

One of the endorsers commented on the pilot's decision not to land on the runway into the wind because of its shorter length. "... the importance of being familiar with landing distance parameters in type aircraft cannot be overemphasized. The pilot was not aware of the fact that he could have stopped the aircraft on runway 35 ..." (in approximately 3500 feet had he been familiar with the information provided by figure 11-81 (sheet 1) of NavAir 01-40AVB-1 which gives realistic stopping distances based on flight test).

MAGNETIC?

One important recommendation made in the accident report was that wide dissemination be made to all pilots throughout Naval aviation of the fact that:

- Surface winds reported by meterological facilities are in true vice magnetic direction and that local variation must be algebraically added in order to determine the winds relative to a particular runway heading.

Another recommendation in reference to crosswind landings stated that:

- All commands operating A-4 aircraft reemphasize the absolute necessity for early and positive application of aileron into the wind and the necessity for not allowing any other consideration to distract from this. It is recognized that flap retraction is extremely important in A-4 crosswind landing technique, however, flap retraction should not be allowed to divert attention to the extent of degradation of aileron application and subsequent directional control.

As mentioned in the opening paragraph, what a pilot doesn't know about a certain situation or set of circumstances can lead to fatal consequences. Fortunately in this instance, despite a lack of knowledge about forecast winds and crosswind landing components, the pilot did know his ejection procedures and because of this did not became a 'fatal' statistic. ◄


The Pisa
Syndrome





A carrier approach through a dense stratus overcast on a moonless night with no horizon triggered vertigo beginning with the "leans" and led to a ramp strike. Events culminated in the ejections of the pilot and RIO after an uncontrollable landing at their bingo field and loss of an aircraft.



NOTHING during the carrier launch and 1.5-hour air intercept training flight gave the slightest inkling of how the night would end. Up to and including marshall prior to recovery everything was normal. On commencing the penetration, however, both pilot and RIO were giving thought to the possibility of vertigo because of the 1300 foot cloud layer beneath them. The ship's change of fox corpen required a 90 degree arc around to final inbound heading, so the pilot remained at 1600 to 1700 feet while completing the arc. Later, when investigators interviewed the RIO, he commented that flying just above the stationary clouds of the overcast may have actually contributed to disorientation.

Once inbound on final bearing the pilot descended into the clouds and leveled at 1200 feet and 10 miles. Shortly after going IFR he began to experience mild vertigo – a case of "leans" during which time he felt that the aircraft was not wings level despite a wings level gyro indication and a steady compass heading. The pilot told the RIO he had vertigo and the RIO began to assist by providing a running commentary of attitude, airspeed and altitude.

Vertigo Intensifies

The pilot was instructed by CCA to dirty-up at six miles. Throughout the configuration change his vertigo intensified. By the time the aircraft was stabilized at approach speed, shortly before SPN-10 (radar) final control, he "really had it bad." Nevertheless, by adhering to his instrument scan, assisted by the RIO's helpful commentary, the pilot was able to commence his descent and establish the aircraft in an acceptable but low and fast condition at SPN-10 minimums. He felt a bit better about his condition and his vertigo was somewhat reduced when he looked from the cockpit to acquire the ball.

At this time the aircraft was on centerline but with a fast chevron and a low ball. Despite several advisories from the LSO the pilot was unable to perform adequate corrections and was subsequently waved off. Now normal anxieties of flying the bolter pattern after a technique waveoff were added to his problems. His vertigo returned immediately – worse than before – apparently aggravated by flying in and out of the 600 to 800 foot stratus overcast that was directly

over the ship. The pilot felt as if he was rolling left and had to devote constant attention to his instruments in counterbalancing his instinct to roll the aircraft to the right. He struggled through the bolter pattern in this condition.

At about five miles downwind, CCA vectored the aircraft to a heading of 320 to intercept an inbound course of 270. Subsequently a heading of 250 was assigned which would have indicated an overshoot and that the aircraft was right of centerline. However, shortly thereafter, the aircraft was vectored to 270 and ended up left of centerline when picked up for final control. Large heading corrections combined with the obvious difficulties in aligning the aircraft with the final inbound course did nothing to improve the pilot's deteriorating mental composure.

Investigators were of the opinion that both pilot and RIO were experiencing a significant breakdown of scan.

A Real Problem

"By then vertigo was really a problem. I was fighting hard to fly CCA instructions," he recalls. "We came off CCA high and left of centerline. I corrected to the right but the ball was still on the very top of the lens. I heard someone say, 'You're high – start it down!' I thought it was the LSO but the RIO says he was the one who made the call. I don't remember hearing another transmission."

Without further consideration of his condition or the poor setup, the pilot began the demanding maneuvers necessary to "salvage the approach."

By this time the RIO had stopped his commentary and was so concerned by the pilot's condition that, in his own words, he was "glued to the instruments." Investigators were of the opinion that both pilot and RIO were experiencing a significant breakdown of scan. Neither communicated the pilot's problem to the LSO or ship. As anxiety increased, their total perception was narrowed to the exclusion of the LSO's urgent calls.

Reconstruction of the pilot's actions during the last 20 seconds of the approach was aided by the PLAT tape, the LSO and the pilot himself. After making a large heading change to correct to final course, what powers of concentration the pilot could muster were channeled toward the meatball. Seeing that it was still at the top of the lens, he reduced power and instinctively rolled left to get aligned. The ball showed no immediate movement since the pilot was unknowingly increasing nose attitude. However, reduced power caused the aircraft to decelerate rapidly. Less than five seconds from the ramp the ball was still high on the lens, although beginning to show downward movement. During these few seconds the pilot was unaware that he was allowing his left wing to drop further so that just prior to hitting the ramp, the aircraft was established in approximately a 30-degree bank.

Dire Situation

Three seconds prior to the ramp strike the ball was still high. By this time, however, the pilot noted an excessive sink rate and added military power. As the ball continued downward, he realized his dire situation. He returned to the attitude gyro to execute a waveoff and went to maximum power. Since he does not recall seeing waveoff lights, which first flashed 1 1/8 seconds prior to impact, investigators decided that he had initiated his waveoff at least one second prior to impact. Considering the scope of the pilot's scan, namely *meatball alone*, the board was of the opinion that his reactions to the ball position and movements were correct. The full power waveoff could not prevent contact with the ramp, but the aircraft apparently was climbing at impact and became safely airborne without engaging a wire or doing any damage to the LSO platform.

Despite a left wing down condition caused by aircraft damage, the pilot managed to establish a satisfactory climb. Once above the overcast, he found he no longer had vertigo.

Gear Damaged

After striking the ramp the pilot found he could not raise the gear. Rendezvous attempts with a tanker were unsuccessful and the aircraft arrived at the bingo field with an emergency low fuel state, providing inadequate time for foaming the runway. When the aircraft touched down, wings level, the left main mount and nose gear collapsed and the pilot was unable to prevent a violent swerve to the left. He initiated a sequenced ejection. Neither pilot nor RIO was injured. The aircraft sustained substantial damage.

The board thought the pilot's expectation of a normal landing – having first executed emergency gear extension procedure – to have been acceptable. His cockpit clues to actual condition of the gear were three down-and-locked indications and the fact that the gear could not be raised. Utility hydraulic pressure was normal. Information from the ship on possible gear damage, the board said, had been ambiguous, at best. Although in the board's opinion the aircrew in this instance could probably have stayed with the aircraft without serious injury until it came to rest, it was felt that the decision to eject was not incorrect.



Here's how the board summed up its findings:

The primary cause of the accident was pilot error in judgment. Considering his advanced case of vertigo and poor CCA setup, he should have decided that continuing the approach was beyond his personal capabilities. In addition, the RIO erred in not informing the LSO of the pilot's vertigo and subsequently leaving the LSO with the impression that the pilot was capable of properly executing the demanding maneuvers required to salvage a poor setup. The physical cause of the aircraft striking the ramp was a severe sink rate induced by insufficient power and a nose high, left wing down attitude.

Contributing Factors

The board also named the following contributing cause factors:

- The setup given by CCA was such that a successful landing could have been achieved only by precise pilot technique and near perfect teamwork between pilot and LSO. (Subsequent endorsers absolved CCA of a contributing role in the accident in the absence of a statement from the SPN-10 controller and PLAT substantiation – the CCA voice recorders were inoperative and the PLAT voice recorder was monitoring the other CCA frequency during the F-4's approach. The pilot's severe case of vertigo was thought to have caused improper response to CCA instructions resulting in poor initial glideslope/lineup on CCA final.)

- The senior LSO allowed an LSO under training to continue controlling a deteriorating approach past the point where it should have been discontinued. In his statement to the board, the senior LSO commented that proper pilot response was mandatory to achieve a successful landing. However, the controlling LSO's first reaction to improper pilot response was to call for more power rather than to wave off the approach.
- Vertigo caused by flying the bolter pattern in and out of clouds on a night with no visible horizon reduced the pilot's capability to exercise techniques required for a successful carrier landing.

Vertigo Aspects

In the accident described above, a case of "leans" apparently progressed into severe vertigo. The investigating flight surgeon states that the pilot had never before experienced vertigo to this degree. He was in good health, was not fatigued and was free of any unusual disturbing emotional factors prior to its onset.

"Careful interview of the pilot," the flight surgeon writes, "reveals that his orientation and perception deteriorated progressively from first descent to ramp strike. By the second time he saw the ball he was not only disoriented and confused but his perception was reduced to seeing only the ball and his gyro. He retained

only minimal faculties and perception and the instinct for survival – enough to recognize his crisis and fly his aircraft out of the hole. The shock of the ramp strike and increased communications restored his perception and orientation immediately."

Vertigo has many faces. Your flight surgeon can discuss its different manifestations with you. Here we will merely consider that particular kind of spatial disorientation experienced by our F-4 pilot – the "leans."

The sensory illusion known as "leans" is a sensation of tilting felt by a pilot when his attitude instruments indicate wings level. The physiological cause for this is the inability of the body's vestibular apparatus to detect gradual motion.

As you will recall from your physiological training, the vestibular apparatus gives the sense of orientation in space and helps maintain equilibrium. The vestibular apparatus is part of the inner ear and consists of three fluid-filled semicircular canals connected to an irregular sac-like organ known as the utricle. The canals are arranged at right angles to each other in vertical, horizontal and transverse planes. Head movement results in movement of fluid in a pair of canals or combination of canals in the plane or planes of movement. Oversimplified, movement of the fluid affects hair-like projections extending from the walls of the canals. These hairs initiate nerve impulses which are interpreted as movements. The trouble is that the fluid in the canals tends to lag behind head movements as, for instance, water in a glass when the glass is rotated quickly. When head motion ceases abruptly, fluid in the canals continues to move in the same manner that water in a glass continues to rotate after movement of the glass is stopped. [1]

Rotation of the head must occur at a certain minimum rate in order to be detected by the semicircular canals. The vestibular apparatus cannot detect "sub-threshold" motion. For example, if during instrument flight, while the eyes are momentarily off the instruments, the aircraft should suddenly roll sharply to the left, the vestibular senses would properly record the movement. Then if the aircraft gradually rolled level at a rate below the threshold of the vestibular apparatus, the pilot would be left with a sensation of being tipped left and would have no awareness of return to a wings level position. Although he would maintain the aircraft in level flight in conformity to the instruments, he would still feel as if he and the aircraft were tipped ("leaning"). Responding to this sensation, he would feel an almost irresistible compulsion to lean to the right which could persist until he broke through the clouds and corrected his equilibrium by referring to the more familiar horizon and other terrestial reference points (or overcame it by proper instrument scan). The leans can also be produced by the opposite sequence of stimuli. [2]

'Vertigo is a symptom fraught with potential calamity. Disaster lurks at its heels, for the man with swaying senses is no longer the Captain of his ship.'

Disorientation is a normal body response to the unavoidable accelerations of flight. Awareness of the possibility of its occurrence, proficiency in instrument flying and experiencing various forms of vertigo in controlled conditions can help build confidence in the ability to cope with vertigo-producing situations.

In his summary on the accident above, the investigating flight surgeon recommends that "aviators be more critical in judging their own capabilities, especially in times of stress such as battle injury, hypoxia, hyperventilation and vertigo. They must be decisive and expeditious in taking corrective measures while their faculties are present. Aviators must inform air facilities of such problems and thereby allow preparation for difficult landings or sending assistance aloft."

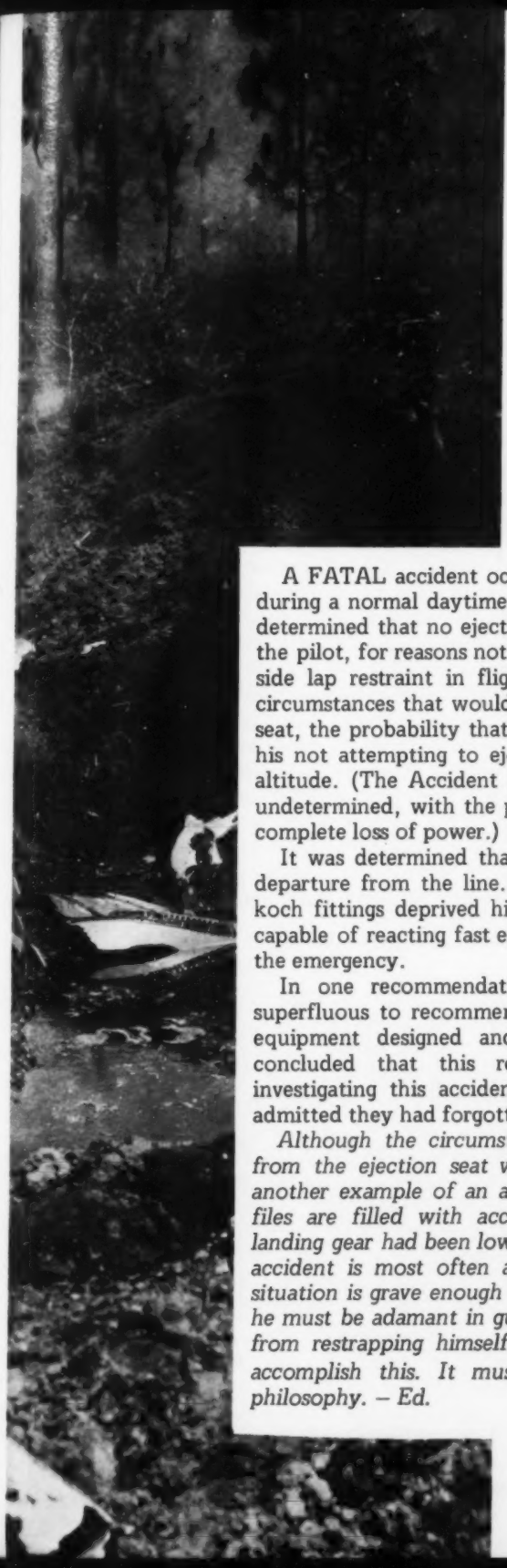
These days we're not as dramatic as the author of a 1919 War Department Air Service publication who stated: "Vertigo is a symptom fraught with potential calamity. Disaster lurks at its heels, for the man with swaying senses is no longer the captain of his ship." Nevertheless, today's aviators have the same physical sensations as did their counterparts 50 years ago. Vertigo is here to stay and the more we know about it, the better prepared we will be to recognize and cope with it, should it appear.

[1] AF Flight Surgeon's Manual 161-1, p. 5-11.

[2] Ibid., 5-15.

Don't let conditions 'add up' to an accident; use NATOPS and subtract a little.

Anon.



Unstrapped and Unprepared

A FATAL accident occurred when a TA-4B crashed short of the runway during a normal daytime approach to landing. From the investigation it was determined that no ejection attempt had been made. It was discovered that the pilot, for reasons not known, had released both koch fittings and the left side lap restraint in flight. Although it is difficult to imagine any set of circumstances that would prompt a pilot to release himself from the ejection seat, the probability that he was aware of this condition would account for his not attempting to eject when faced with power loss at extremely low altitude. (The Accident Board concluded the cause of the accident to be undetermined, with the probable cause as loss of combustion resulting in a complete loss of power.)

It was determined that the pilot had been properly strapped in prior to departure from the line. Therefore, his subsequent actions in removing the koch fittings deprived him of any possible chance of survival had he been capable of reacting fast enough to initiate ejection sequence at the instant of the emergency.

In one recommendation the Accident Board stated: "... It seems superfluous to recommend that flight crew personnel be reminded to use equipment designed and provided to save their lives; yet it must be concluded that this requirement exists, because, in the course of investigating this accident, several instances were reported wherein pilots admitted they had forgotten to strap in."

Although the circumstances which caused the pilot to unstrap himself from the ejection seat will never be known, it is conceivable that this is another example of an accident caused by interrupted habit pattern. The files are filled with accounts of wheels-up landings occurring after the landing gear had been lowered and then retracted on a waveoff. That type of accident is most often attributed to an interrupted habit pattern. If the situation is grave enough for a pilot to release himself from his ejection seat, he must be adamant in guarding against any distraction which prevents him from restrapping himself to the ejection seat. Written procedures cannot accomplish this. It must be more of a "to thine ownself be true" philosophy. – Ed.



Short Snorts

For Goodness Sake

AWARENESS is beautifully explained by a quote from the Bible, Matthew 13:17 with these words:

"Let all those with eyes to see, see.

And those with ears to hear, hear."

This is a very simple explanation of a condition important to all pilots. Important because it is possible for anyone to look at something and not actually see it, i.e. it doesn't register.

This may have been the reason for a ground accident between two big choppers. Helicopter No. 1 was holding short of the duty runway on a parallel taxiway. The pilot was awaiting clearance to take the active runway when the main transmission light illuminated. The pilot decided to return to the squadron flight line and executed a 180 degree turn on the taxiway. As he completed his turn his attention was drawn to a small gunship at his 10 o'clock position (the pilot was getting out of the helo even though the rotors were still turning). Almost simultaneously the pilot of helo No. 1 suddenly realized his rotor blades were getting close to the blades of another large helicopter parked nearby. Before he could react the crunch occurred.

Helicopter No. 1 suffered damage to three main rotor blades (tip caps destroyed and about six inches of the main spar of two blades crushed) and helicopter No. 2 had one blade similarly damaged. The irony of this incident is that there had been an APM (all pilot's meeting) the day before and, you guessed it!, the subject had been: rotor clearances, information and procedures concerning. The C.O. in his endorsement stated, "Awareness in the cockpit cannot be overemphasized." How true.

OOPS

A DESIGNATED copilot of a UH-34D performed a maintenance turnup early one morning (before breakfast) and noted that the engine RPM rose a mite high, to 2500 on start! Although he knew that this was unusual he assumed that it was due to his starting technique and did not think it was necessary to report it to maintenance control. A little while later (after breakfast) the same copilot was scheduled in the same aircraft for a local training hop and during this start the engine oversped to 3500 rpm! Both pilots quickly closed the throttle but the engine did not respond until the mixture control was moved to IDLE CUTOFF. An engine change was required.

An investigation of the incident revealed that improper starting procedures had been used. After the copilot started the engine on prime the pilot reached up and advanced the mixture control before the engine was allowed to run smoothly on prime. This shortcut coupled with throttle linkage binding between the roller and pulley cam caused the overspeed.

Now let's play the IF game and see how many IFs we can come up with.

IF the copilot had reported the surge on the maintenance turnup . . . .

IF the copilot, who suspected his own technique, had taken the time to refresh his memory on starting techniques . . . .

IF the copilot had mentioned the earlier problem to the pilot . . . .

IF the pilot had kept his cotton-pickin' hands off the mixture control . . . .

IF NATOPS procedures had been followed this *costly, avoidable* and *inexcusable* incident could have been prevented.

Weather Information

If you have any questions concerning weather and its relation to naval aviation which you cannot find satisfactory answers for, send them to the Commanding Officer, Fleet Weather Central, Naval Air Station, Norfolk, Va. 23511, who has volunteered to do the necessary research and supply the answers.

UH-2C Test Flight

THE UH-2C assigned to an HC Det aboard a CVA was to be test flown after a main rotor blade change. The pilot, with a mech as qualified observer in the left seat, climbed to about 1000 feet in order to check the autorotation RPM. He headed into the wind and pulled the No. 1 engine condition lever back to 70 percent Ng and instructed the observer to pull the No. 2 engine condition lever back to the same setting. The observer complied and as he did the pilot noted the No. 2 Nf drop to idle and Ng drop to 42 percent. The pilot advanced both condition levers to FLY but No. 2 did not respond. He tried two unsuccessful air starts and when neither worked he declared an emergency, dumped fuel and made a successful single engine approach and landing aboard the CVA. The observer stated that he had difficulties moving the No. 2 engine condition lever out of FLY and *might* have pulled it all of the way off.

The NATOPS manual approves a qualified observer to occupy the left seat during maintenance test flights. However, changes in throttle settings should be made only by a pilot. Someone not familiar with the direction of travel and the amount of force required to move the condition lever could easily pull it all the way through IDLE to OFF. A study recently completed by NavSafeCen of T-58 engine problems (over the past three years) has not indicated any previous problems in air starts. The NATOPS manual sets forth rather simple straightforward procedures for air starts and NavSafeCen would like to know if any of you T-58 operators have had air start problems and, if so, under what conditions.

MECH Available By Subscription

Beginning with the Summer '69 issue, MECH, the magazine for naval aircraft maintenance and support technicians, will be available to the public through private subscription. Industry, publishers not on the Exchange List, Reservists and others having a need for personal copies may order the magazine from the Division of Public Documents, Government Printing Office, Washington, D.C. 20402.

Subscription rates: Single copy, 75 cents; 1-year (4 issues) $3.00.

Head Up and Locked

THE CREW of a UH-2A was scheduled for an external cargo training flight at Homebase. After engine start and rotor engagement, the cargo hook unlock light illuminated. During preflight the hook had been checked in the closed position. The pilot assumed a faulty light and proceeded to the practice area. He hovered the helo while the ground crew hooked up cargo – *with the light still on.* He departed with his external load, which remained attached for about 300 yards *and then fell*! Investigation revealed excessive dirt and grit in the locking mechanism which prevented the hook from fully closing.

Warning lights are put into aircraft for one function – to alert aircrews when something goes wrong. Each and every illuminated warning light should be thoroughly investigated.

Did You Know

ATP 7110.8 (FAA Terminal Air Traffic Control Procedures Manual) forbids air controllers to approve a pilot request (or to ask the pilot) to conduct unusual maneuvers within an airport traffic area if they are not essential to the performance of flight. It follows that pilots also have a responsibility not to request clearances which controllers are forbidden to approve. ◄



'One thing for sure, Tower, it ain't the friendly skies of United.'

Hearing Conservation



A NEW instruction on the Navy's hearing conservation program has been issued by the Bureau of Medicine and Surgery (BuMedInst 6260.6B, 5 March 1970). This instruction applies to all commands and activities having high intensity noise levels and to all military and Civil Service personnel. Enclosure 1 to the instruction outlines a hearing conservation program. Here is a brief excerpt:

"The health problems created by intense noise ashore and afloat continue to increase. In addition to the danger of blast and impulse noise (gunfire and rockets), continuous and intermittent exposure to loud noises such as those created by jet and propeller-driven aircraft, marine engines and industrial-type activities may result in hearing loss. This loss may be temporary, disappearing after a period of nonexposure, or it may be permanent because of irreversible injury to the inner ear. Susceptibility to hearing impairment due to noise varies greatly among individuals. Loss of sensitivity occurs first in the higher frequencies in the 4000-6000 Hertz range. Individuals may sustain quite extensive impairment before the important speech range (500-3000 Hertz) is appreciably affected and long before they become aware of any difficulty in understanding speech.

"The maximum daily level of permissible human exposure to noise is greatly influenced by factors such as the frequency spectrum of the noise, whether the noise is intermittent or continuous, the duration of the exposure and individual susceptibility. Although individual noise susceptibility cannot be readily predicted, nor is it always possible to monitor the noise exposure of all personnel, knowledge of the relationship between noise exposure and hearing impairment provides for the establishment of guidelines which will alert individuals to the existence of noise hazards and will protect the hearing of the majority of personnel so exposed . . .

"The effectiveness of a hearing conservation program depends primarily on the general awareness of the hazardous noises in the working environment, the validity and reliability of threshold pure tone monitoring audiometry, the widespread use of hearing protective devices and the reduction of hazardous noises by engineering control methods . . . "

When the noise level exceeds 90 dBA (decibel reading on the A-scale of the noise level meter), further assistance for analysis of hazardous noise environments can be obtained by contacting industrial hygienists attached to Preventive Medicine Units or employed by local commands and hearing conservation analysts from the Naval Aerospace Medical Institute, Pensacola, or the Naval Missile Center, Point Mugu.

io Program

Allowable Noise Exposure

Duration Per Day in Hours	Sound Level dBA
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

(These values apply to total time of exposure per working day, regardless of whether this is one continuous exposure or a number of short-term exposures, but *do not* apply to impact or impulsive type noises.)

The instruction contains an appendix listing ear protective devices available through supply channels.

Ear Insert Devices. Listed below are the ear insert devices available through medical supply channels:

(1) Plug, Ear, Noise Protection, (size), 24s. (V-51-R Type.)

(a) FSN 6515-664-7858 Extra Small
(b) FSN 6515-299-8290 Small
(c) FSN 6515-299-8289 Medium
(d) FSN 6515-299-8288 Large
(e) FSN 6515-664-7859 Extra Large

(2) FSN 6515-082-2675 Plug, Ear, Noise Protection, Regular, Triple Flange, 24s. (Plastic Sterilizable.)

(3) FSN 6515-082-2676 Plug, Ear, Noise Protection, Small, Triple Flange, 24s. (Plastic Sterilizable.)

(4) FSN 6515-721-9092 Plug, Ear, Noise Protection, Cotton, Impregnated, Disposable, 100s.

(5) FSN 6515-299-8287 Case, Ear Plug, 12s. (This case holds one pair of any of the above mentioned ear plugs.)

(NOTE: To provide maximum protection, ear plugs must be fitted individually, preferably by trained personnel. An ear plug which does not fit merely lulls you into the belief that you are getting hearing protection.)

Ear Muffs. Listed below are the ear muffs available through regular supply channels:

(1) FSN 2RD 4240-759-3290 LX5X, Aural Protector, Sound, 372-9AN/2.

(2) FSN 2RD 4240-979-4040 LX5X, Replacement Seal, Aural Protector.

Flight Deck Helmets. Aviation supply depots stock flight deck helmets in 16 combinations of color and size. These are listed under Aviation Flight Clothing as Flight Deck Sound-Attenuating Helmet, Class R8475, Type 273-9HA. This item includes the standard Navy ear muff and headband which may be worn with or without the interchangeable cloth helmets.

Films available for noise conservation education purposes are: MN-9318A, Medical Aspects of High-Intensity Noise – General Effects; MN-9318E, Medical Aspects of High-Intensity Noise – Prevention of Hearing Loss; and MN-9318C, Medical Aspects of High-Intensity Noise – Ear Defense.

A final word here – squadron and station hearing conservation education programs should emphasize the *total* environment. Hearing protection on the job won't do a man much good in the long run if his off-hours include such activities as working on his car in a noisy automotive shop or sitting in a discotheque where the music is amplified to 120 dBA. Ears are a one-time issue; they are worth taking care of. ◄

The August 1968 issue of APPROACH contained the first article on IFARS. This is the second.

IFARS

(Refined)



TWO YEARS ago (1July 1968) the Individual Flight Activity Reporting System came into being. It promised much and experience gained from it thus far has proven to be beneficial. Initially IFARS was to evolve in three phases and although not every objective has been met, most have. This then is a report on refinements which are going to be implemented on 1 July 1970.

New Aspects

Two developments have taken place this fiscal year which are directly related to the IFARS. The first action is the preparation of OpNav Instruction 3710.7E (effective 1 July 1970) which revises OpNav Instruction 3710.7D. OpNav Instruction 3710.7E incorporates a new Naval Aircraft Flight Record (yellow sheet) which is OpNav Form 3760/2 (Rev 9-69). The new yellow sheet is shown in Fig. 1. Changes which have occurred are marked by arrows. Two pertinent sections of OpNav Instruction 3710.7E are Section 920 which details the yellow sheet changes and Section 950 which explains the IFARS program. The second action is issuance of OpNav Instruction 3760.10A which establishes instructions and procedures for submission, validation and data processing of IFARS data. The carbon copy of Part D of the yellow sheet, identified as OpNav Form 3760/2A (Rev 9-69), the IFAR data collection form, is used to keypunch the data cards. For those of you who do not have access to regular yellow sheets, the auxiliary IFAR data Form 3760/70 (Rev 9-69) shall be utilized for the submission of IFARS data. This form may be processed through local data processing facilities or forwarded directly to NavSafeCen (Code 50) for card punching.

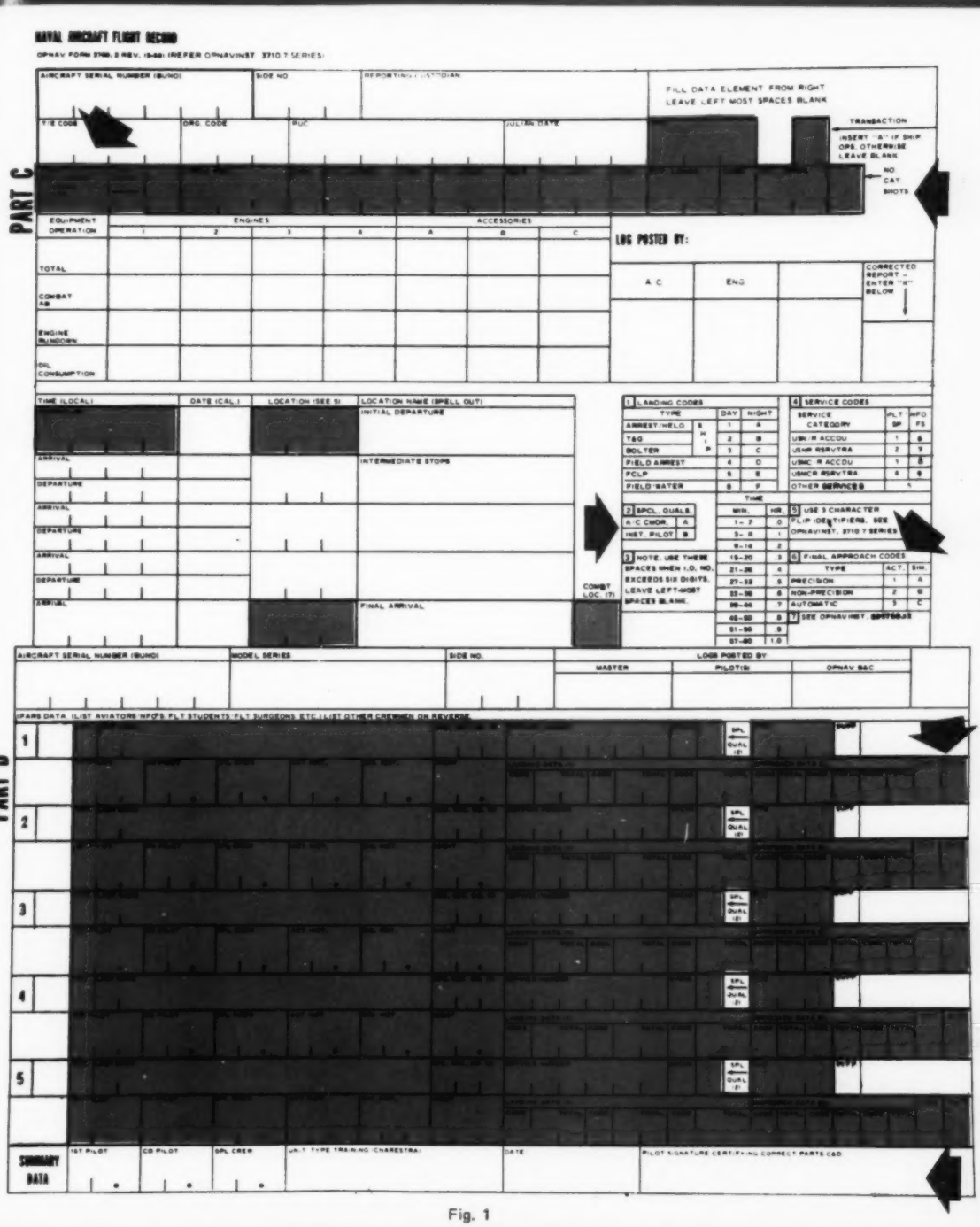


Fig. 1

Continued

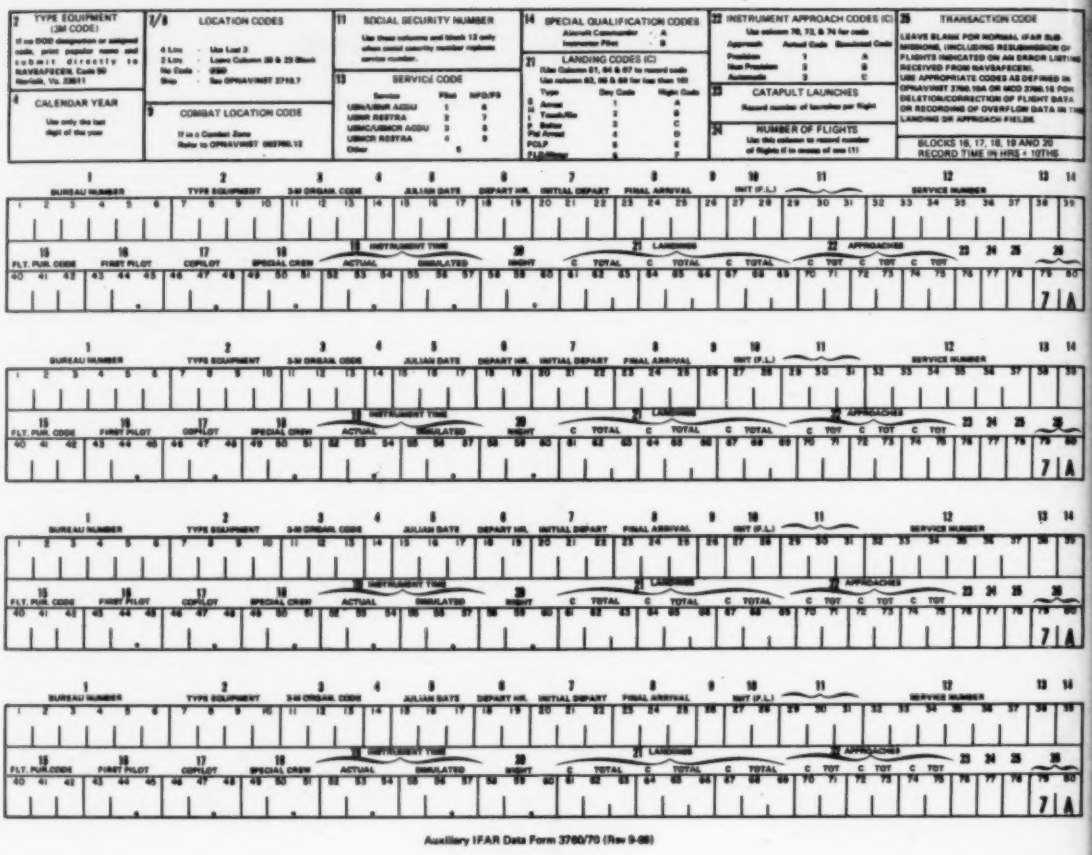


Fig. 2

OpNav Form 3760/70 (Rev 9-69) is shown in Fig. 2. Notice that instructions appear at the top of the form and are keyed to certain columns of the form to assist pilots in filling them out correctly. Those columns which are self-evident are not keyed.

The new yellow sheet has been revised to eliminate data transcription problems of 3M flight data (76 card) and IFAR data at the unit level and to provide for easy comparison with the ASD-1 and IFAR-1 tabulations. The new IFARS sheet can accommodate up to a four-flight trip whereas the original sheet required four separate entries. The same holds true for the 3M flight data (76 card) entries. One sheet can accommodate four flights on a single trip. Quite an improvement!

Entries

Use of the new yellow sheet will require some familiarization effort on the part of pilots even though they are accustomed to the old yellow sheet. In the interest of legibility it is still necessary to PRINT all entries and to PRESS HARD with the pen or pencil. This will ensure that the data entered on the yellow sheet will be duplicated properly in selected areas on succeeding forms. The carbon copies are the working copies for keypunch operators to punch the 76 card and IFAR data card. The attention of all pilots is directed to Section 920 of OpNav Instruction 3710.7E to ensure comprehension of the shaded areas of the yellow sheets. Maintenance personnel should also read this same section to fully understand the yellow sheet entries for which they are responsible. These areas must have legible data. *The usefulness of the form is made or broken here.*

Benefits

The new yellow sheets and IFARS sheet have two main benefits. They reduce the manhours previously required in data transcription and reduce the possibilities of errors inherent in transcription.

I Think I Can, I Think I Can!

By CDR C. H. Zilch
Ass't Director for Meteorology and Oceanography
CinClantFlt

LT Middeck: "This is LT Middeck. Will you give me the Washington, Albany and NAS Brunswick sequence reports and winds at 6500 feet?"

Weather Briefer: "Yes sir. At 0700 Washington National was reporting clear skies, visibility more than 10 miles, surface winds 180 degrees at 12 knots. Albany visibility is still good and they report scattered cirroform clouds . . . their wind is 130 degrees at 15 knots. At 0600 Brunswick was clear, visibility 10 miles, surface wind from 350 degrees at 25 knots. Winds at 6500 feet will average 230 degrees at 25 knots. Sir, would you like a weather briefing for your flight? A front lies . . . " (LT Middeck interrupts at this point.)

LT Middeck: "No, that's all right, thank you. I'm in a big hurry. I'll check the weather along the way."

IF you say this sort of thing doesn't happen – think again. Navy regulations as well as Federal Aviation Regulations specify requirements for proper "preflight action" on the part of the pilot. One of the *most important* preflight actions to be taken by a pilot in command is obtaining sufficient data concerning enroute and destination weather. Too often the type of weather brief described above happens, especially during enroute stopover flights.

And Then We Have This Enroute Weather Briefing Dialogue . . .

Pilot: ". . . Dallas Radio, I am six miles east of Dallas at 8500. Will you give me the latest Kansas City weather . . . ?"

Dallas Radio: "At 1200 Central Time Kansas City was measured 1800 overcast, visibility 10, very light drizzle, temperature 39, dewpoint 35, wind 220 degrees at 15, altimeter 29.99, low clouds west approaching station – Kansas City AIRMET (Airmen's Meteorological Condition) moderate icing in eastern third of Kansas, conditions continuing beyond 1500 Central and moving eastward – pilot report at 35 northwest of Kansas City, moderate rime icing 5,000-9,000 feet MSL, type aircraft S-2 . . . "

Pilot: "I believe that I can make K.C. OK VFR, don't you?"

Dallas Radio: "Negative, conditions have deteriorated rapidly during the past two hours. I'll give you the Kansas City forecast."

Pilot: "That's OK. I'll take a look and if it gets too bad I'll turn around. It's 1800 and 10 at K.C. – I think I can make it."

Was this "preflight action" taken by the pilot in accordance with General Flight and Operating Instructions (OpNavInst 3710.7 series) or FAR Part 91? No! FAR Part 91 states, in part: "Each pilot in command shall, before beginning a flight, familiarize himself with all available information concerning that flight. This information must include, for a flight under IFR or a flight not in the vicinity of an airport, available weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed . . . " The NATOPS Manual states, "Except in emergencies and flights of combat necessity wherein conditions do not permit, pilots shall ensure that all preflight planning required for the prosecution of a safe and properly conducted flight has been accomplished prior to carrying out any type of flight in a naval aircraft."

What should a pilot ask for and expect from a weather briefer? First and foremost a pilot should have a better than average knowledge of weather and the effect of weather on the flight which he intends to make. Armed with this knowledge he is in a position to evaluate the weather briefing he receives.

As a minimum he should expect and get –

- Position of highs, lows, fronts, ridges and troughs, i.e. a weather synopsis.
- Current weather conditions at destination, alternate and enroute (and here is where PIREPS really help).
- Forecast weather not only at destination and alternate but enroute as well. (What do you do during an enroute emergency?)
- Alternate routes. (ATC must reroute traffic now and again.)
- Hazardous weather. (This greatly depends on type aircraft so be sure to inform the briefer early in the game your aircraft type, proposed type of flight, altitude, airspeed, etc.)
- Forecast wind aloft. (To build your confidence and to assist the briefer, learn the rudiments of reading forecast upper air charts. An intelligent question or two will pay large dividends.)

Finally, the next time you fly, properly fly the weather as well as the beautiful bird you are so proud of and don't "*think* you can make it" – KNOW that you can and will. ◄

Don't Be Surprised

By CDR C. H. Zilch
Ass't Director for Meteorology and Oceanography
CinClantFlt

THERE you are, tooling along in your J80 afterburner equipped *FlugenJet* at FL380, fat, dumb and happy. Nothing can touch you. The king of all you survey, right?

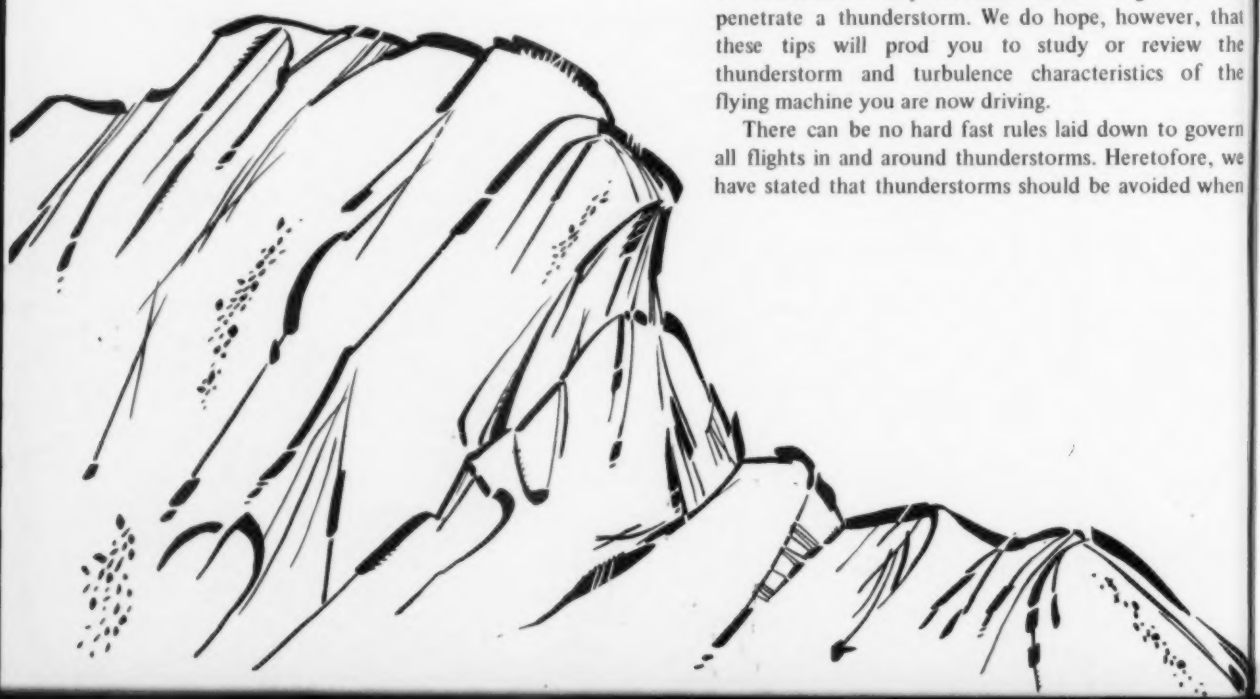
Then suddenly dead ahead you see a squall line and then a line of thunderstorms dreamed up by Zeus himself. Real granddaddies! No sweat, you think, I'll just climb over them. A quick change of altitude with Center, a power increase and climb. As they say in the movies, "Then there occurs an awful thought" – that those bloody storms are growing faster than you can climb! A solid wall of rain, super turbulence, engine chugs and then out goes the fire and you are one jet jockey who is in for a helluva ride.

Don't chortle too loudly, Phan Pushers. How 'bout the jerk who knew his *Phan Phlyer* could NEVER top those thunderstorms and decided to go under? Remember that old saying about being VFR when you're not? Here it comes again.

Fast Fred decides to go under the storm since he has heard that's the least turbulent area. VFR is the only answer. So Fred drops down to 1000 feet and starts under. Then he finds he must go lower and lower until finally there ain't no lower to go. Yipes! – there it is looming out of the gloom, one each Mk-1 Mod 0 Cumulo Granite. Zlunk! No more Fast Fred.

Friends, there will probably come a day in every "Birdman's" life when he *must* fly through a thunderstorm. When and if that day comes to you, there is only one answer to your dilemma – be prepared. Here are a few general tips to assist in your preparation. They are not to be taken as a *panacea* – and certainly not to be construed as any recommendation to go out and penetrate a thunderstorm. We do hope, however, that these tips will prod you to study or review the thunderstorm and turbulence characteristics of the flying machine you are now driving.

There can be no hard fast rules laid down to govern all flights in and around thunderstorms. Heretofore, we have stated that thunderstorms should be avoided when



feasible, due to obvious reasons. However, this advice *does not* mean avoid thunderstorms at *all cost*. Far too many pilots have attempted to overfly thunderstorms only to find the tops higher than the service ceiling of their aircraft or have experienced flameouts caused by excessive angle-of-attack and altitude. One sure bet is that it is no picnic to come down through the middle of a thunderstorm with no power!

Most NATOPS manuals contain a section which outlines speeds, configurations and recommended techniques which are best for flying through thunderstorms in a particular model aircraft. Tips and suggestions are generalized in this discussion and if they vary from a particular NATOPS manual, should not be construed as superseding that pub. No thunderstorm should be regarded as "light" and any decision to go or not-go must be based on the following: pilot experience, pre-planning, knowledge, aircraft type and performance, radar available, vertical extent and physical appearance of the thunderstorm. (In this respect it is best to avoid, if possible, any storm which has radar echo tops of 35,000 feet or higher. Tops of thunderstorms as indicated by radar are often in error by several thousand feet.) However, if you must penetrate a storm, the following general flight procedures are recommended and give the highest probability for safe passage:

- Get your aircraft ready for thunderstorm penetration prior to entry by checking instrument and cockpit lights full bright; pitot heat on; safety belts and shoulder harnesses locked and tight; set recommended power settings and slow to the recommended severe turbulence speed for your aircraft, and mentally prepare for *attitude* flying and thunderstorm hazards.

- If there is a choice, establish a penetration altitude to avoid the area from the freezing level upward to -10C (about 5000 feet above the freezing level). Many successful penetrations have been made between 4000 and 6000 feet above the highest terrain. This area has been termed the "softest" altitude. Four thousand feet above the highest terrain in the area should be the minimum penetration altitude.

- Fly the recommended airspeed range for turbulent air penetration in your aircraft. This airspeed will reduce the hazard of exceeding stress limitations and improve the probability of maintaining control. Trim the aircraft for penetration airspeed *before* thunderstorm entry.

- Change power settings to establish the recommended airspeed *prior* to storm penetration. There will be enough to do once in the storm, so keep power settings as constant as possible. Airspeed indicators often give false readings in vertical drafts and heavy rain.

- Avoid unnecessary maneuvering while in a thunderstorm by flying in as straight and level an attitude as possible.

- Choose a heading prior to entry, if possible, that will take you through the storm in minimum time and then *maintain* it. Use all available information such as radar, lightning flashes and storm appearance to determine the best heading. Once committed, don't turn around.

There is no intent to imply that the foregoing procedures are complete but they do provide some information to guide your further study. To quote an old, old pamphlet on naval aviation, remember:

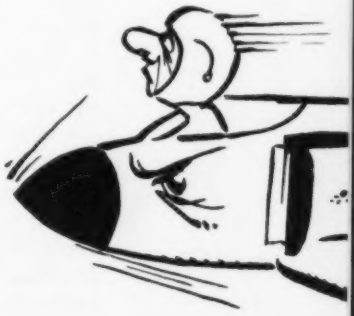
"If you keep your head, your aircraft will (probably) outfly the storm.

"Don't change your course.

"Don't change your mind."

If you must go through a thunderstorm, the only way to do it is go directly through. Attempting to turn around *after* thunderstorm entry can frequently lead to more hazardous flight conditions than you have already encountered. Such hazards include flying into more turbulent conditions, remaining in the storm longer and increasing the possibility of stall by increasing angle-of-attack and angle-of-bank. Finally, remember it is better to arrive at your destination late and safe than not at all. Don't be ashamed of a 180-degree turn *prior* to penetration and while still well clear of the storm. This deft maneuver has saved many lives and aircraft and could have saved many more.

Preparation and forethought will be of invaluable assistance when you do come face to face with a thunderstorm. Think about what you are going to do in advance – don't get caught napping! ◄





METAL or SAND?

These Pros Took the Time to Find Ou

DURING a recent preflight check of his F-8 *Crusader*, Lieutenant Commander Frank Bachman, VF-124 Safety Officer, noticed some tiny foreign particles in the tailpipe. Not content to assume that these were grains of sand which had somehow been blown into the chamber, he downed the aircraft for a closer inspection by maintenance department personnel. Although most bystanders agreed that the foreign objects were bits of sand, Master Chief Aircraft Maintenanceman Norman D. Ricker was not completely satisfied. To be certain that the assumption was correct, he held a magnet over the substance and discovered that the particles were metal. He then ordered an open engine check.

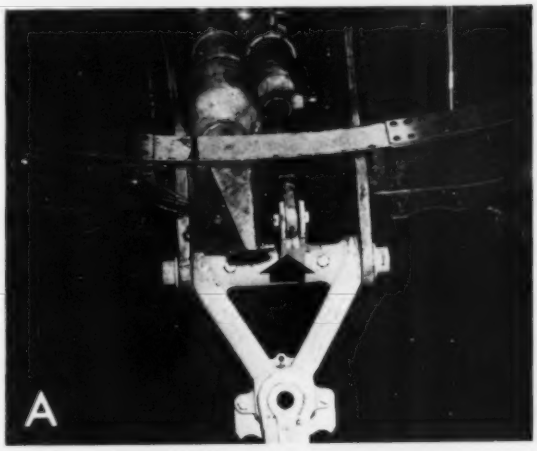
The engine showed numerous cracks in hot section components although having been overhauled just 40 hours previously. The careful observations made by Chief Ricker and the decision to down the aircraft made by Lieutenant Commander Bachman demonstrate the value of professional preflight procedures *and* follow-up action to correct discrepancies when they appear, even though they are seemingly insignificant.

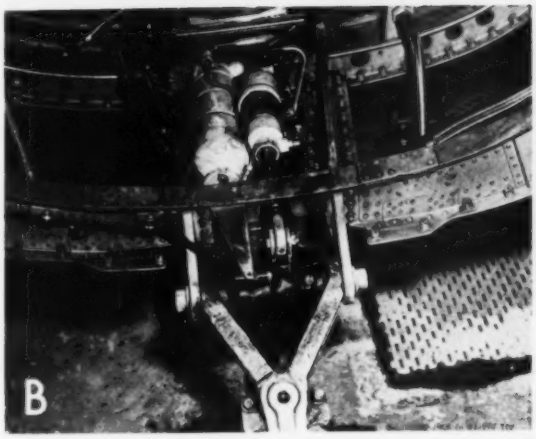
◄

Contributed by VF-124

MURPHY'S LAW *

A-7A Tailhook Installation





DURING a quality control inspection of an A-7A, it was noted that bolt P/N 215-44462-1 (item 4 page 169, NavAir 01-45AAA-4-3) was installed backwards allowing it to strike the tailhook micro-switch with sufficient force to bend the micro-switch mounting bracket. This resulted in a false indication to the pilot in the cockpit. Incorrect installation is shown in Photo A. Photo B shows the bolt correctly installed.

* If an aircraft part can be installed incorrectly, someone will install it that way!

LETTERS

Don't worry about who's right, drive and walk so that you will be left.

NorVa Dopesheet

Water Training

NAS Norfolk, Va. – It seems that with every report of an ejection over water there are also problems either getting out of the parachute or with the use of survival equipment.

I feel much of this comes from the lack of experience on the part of the aviator concerning landing in the water and how not to be dragged by his chute. After training at Pensacola I think every aviator knows how to escape from his chute if the wind is pulling him through the water. Nowhere, however, is the aviator given the experience of trying to release himself from his chute with a seat pan dragging him under water, the chute and shroud lines loose and tangled about him and unable to feel anything because he is wearing gloves.

I feel that instead of being dragged through the water every time "swimming" needs updating, aviators should wear a torso harness, either simulated or real survival vest, helmet, gloves, boots, flight suit, a seat pan and the flotation device normally used (Mk-3C or LPA-1). They should then be hung above the pool with as much of a parachute as possible (at least shroud lines) and then be dropped into the pool to "survive."

I think more people are lost due to problems related to being tangled in a chute than are dragged by the wind and our training should combat this. Squadrons are presently able to give training in use of equipment, but few can go to the depth I think is needed. The combination of water and unfamiliarity with the situation is costing us lives.

LTJG R. L. Schaal, USN
VA-65

● Your points on survival training are well taken. They are being considered and evaluated in the Life Sciences Department of the Naval Safety Center and forthcoming recommendations will be forwarded to those agencies which direct survival training procedures and curricula. These recommendations will also be forwarded to you under separate cover.

Illusions

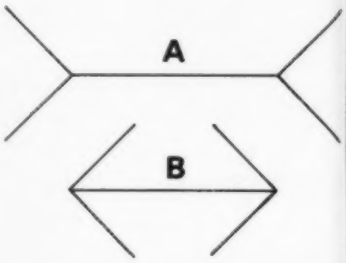
NAS Dallas, Tex. – Upon receiving the March 1970 issue of APPROACH, I began to thumb through it and found it very interesting, especially the article on the inside back cover entitled "Illusions." Upon studying this trick on the eye and then reading the answer, I could not believe it, so with the assistance of one of my superior petty officers I began to measure it and line A-Y was exactly 3.25 inches and line A-X was exactly 3.125 inches, so your answer is wrong. A-Y and A-X are not the same length.

AMH3 Everett L. Swenor, Jr.
Work Center 900

● At first we were inclined to suspect that your ruler was not properly calibrated but after carefully remeasuring the lines, we are forced to agree that there is a slight difference in the length of the lines. This difference is about one-tenth of an inch, so we congratulate you on having such sharp eyesight; also upon your unwillingness to accept as gospel truth something which your senses tell you is wrong – at least without further investigation.

While the lines A-Y and A-X are slightly different in length, it is an interesting fact that it is the line which *appears* shortest which is actually the longest, so our allusion to illusions is still valid. That is, things are not always as they *appear* to be.

As a parting shot, take a look at the following illustration:



Which line is the longest, A or B? Any answer other than "Neither" is wrong. And we guarantee this is a fact – give or take a few ten-thousandths of an inch!

Keep those cards and letters coming.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

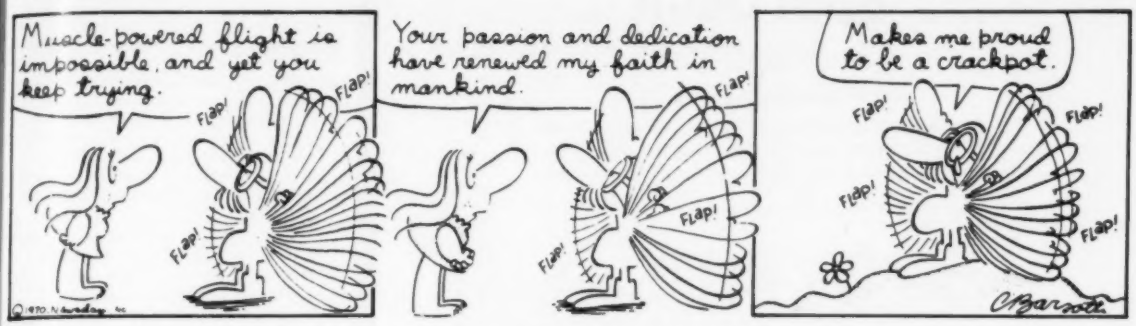
Lost Communications Transponder Code

FPO, San Francisco – While reading "On the Glide Slope," in your March 1970 issue (a very educational and essential article for those naval aviators who may not otherwise be able to keep up with the ever-changing art of instrument flying), I found that Aggie goofed.

The last question in the article dealt with a no-radio situation in which Aggie advised, among other things, to squawk emergency code 7700. As of 1 February

Sally Bananas

by Charles Barsotti



1970, a new lost communications squawk of 7600 was implemented by the FAA as stated in part 1 of the Airmen's Information Manual.

An Interested Reader

• Sorry, we goofed. You have a very good point which we are happy to pass on; however, it should be noted that this information is also now set forth in the IFR Supplement and in Section II of the Flight Planning Document. Finally, even though code 7600 has been designated as the lost communications squawk, code 7700 remains as the emergency squawk.

What's The Wind?

NAS South Weymouth – In the April issue of APPROACH in the Short Snorts section you asked for comments on the suggestion of a Commanding Officer that pilots in the traffic pattern be provided with continuous wind information during gusting conditions. We continually have gusty, crosswinds here and our controllers keep us advised, if requested, during all approaches. I would like to see this become standard procedure for tower operators.

MAJ E. A. Homer, USMC
MARTD

• Thank you for your interest. We concur with your remarks. This suggestion has been brought to the attention of NavSafeCen facilities experts and is presently undergoing discussion and evaluation.

Self-Adhesive Nonskid

In the Letters section of the February 1970 issue we passed along an idea initiated by VT-27 concerning self-adhesive nonskid material for use on *Stoof* boarding ladders. The correct FSN for the material is *90 7220 – 205 – 0389.*

Dropped?

APO, San Francisco – At one time we were on distribution for APPROACH magazine, but somewhere along the line we were apparently dropped. I would appreciate being put on your mailing list for one copy, primarily to be used as a source for ideas and material that would more effectively help *Combat Safety* magazine promote accident prevention in Southeast Asia.

I have respected the fine quality of your publication for many years. Little did I dream that I would some day be involved in a less sophisticated but sincere effort to perpetuate a similar publication. It is an interesting challenge that leads to a greater appreciation of the work that goes into the fine product your people put out.

LT COL Gerald A. Kutz, USAF
Combat Safety Magazine

• After those kind words how could we refuse? You are back on the good list. Is one copy of APPROACH enough? Please continue to send us *Combat Safety*.

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Vol. 15 **approach** No. 12

RADM Roger W. Mehle

Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

Contents

1 Aircraft Fires and Explosions
Some of the "What's, Why's and Wherefore's" concerning inflight fires.
5 Defensive Driving
6 Cross-Country Flights
8 You get no bread with one meatball!
By LT W. J. Mooberry
A look into the mystique of the "mechanical meatball."
13 Feather No. 4
16 1969: A Bad Year
21 It Just Wasn't My Week!
22 Night Ditching
24 More Games Pilots Play
26 True or Magnetic?
28 The Pisa Syndrome
That insidious destroyer of aircraft strikes again.
48
33 Unstrapped and Unprepared
38 IFARS (Refined)
41 I Think I Can, I Think I Can!
By CDR C. H. Zilch
42 Don't Be Surprised
By CDR C. H. Zilch
44 Metal or Sand?

Departments

14 Anymouse
34 Short Snorts
36 Flight Surgeon's Notes
45 Murphy's Law
46 Letters
IBC Let's Finish in the Money

NavWeps 00-75-510

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Next Month

Flightleadership

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PHC Harry Culbertson, Photographer
K. E. Warmack, Editorial Assistant

Credits

The critical moment in carrier landing, shown in our cover painting by J. J. Carr, is a true test of the skill and ability of today's naval aviator. Painting courtesy Norfolk Police Dept., Norfolk, Va. **Pg 47** Sally Bananas by Charles Barsotti courtesy News Day and the Norfolk Ledger-Star.

We are now entering the homestretch, So . . .



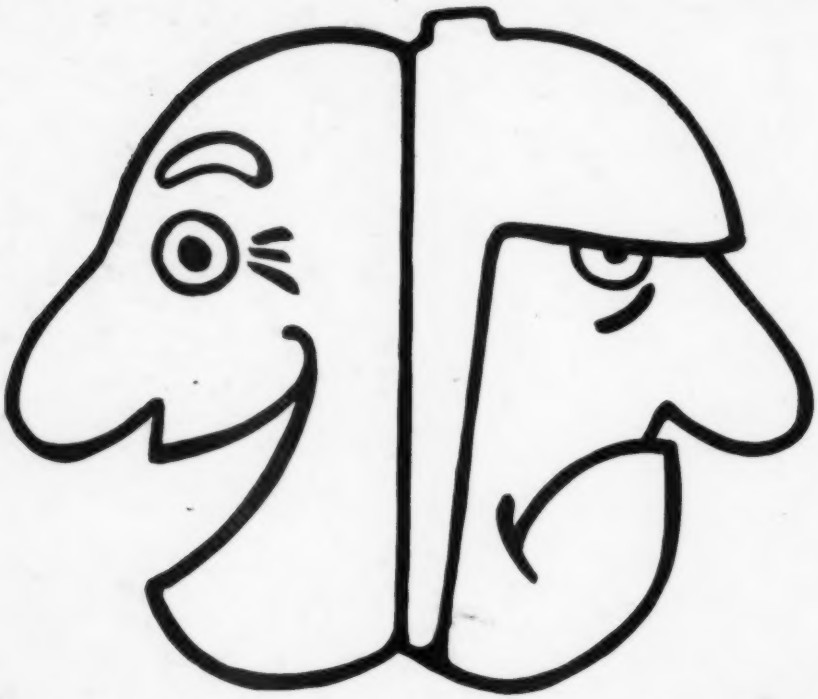
Win, Place or Show

THE current fiscal year will draw to a close on 30 June 1970 – only one short month from now. So it may be said that we are now entering the homestretch in our year-long efforts to achieve the FY 70 goal of 1.0 accidents per 10,000 flight hours.

Where do we stand as the fiscal year draws to a close? The answer seems to be "good but not nearly as good as we want." Our cumulative accident rate for the year (up to 18 April) stood at 1.34, compared to 1.40 on the same date in FY 69. This means that there has been *some* improvement in the accident rate over the preceding year. However, it now appears that it is a practical impossibility to WIN the goal of "1.0 in 70," but this should not signal any letdown in our accident prevention efforts, for it is not beyond possibility that we can yet PLACE by equalling or bettering the all-time low rate of 1.25 established in FY 65. Whether we are able to do this or not, there is no doubt that we can still make a good SHOWing by charging down the homestretch at full speed to cross the finish line with a FY 70 accident rate which is substantially lower than the FY 69 rate of 1.41. Continue to give it the best you can . . .

LET'S FINISH IN THE MONEY!

ARE THERE TWO OF YOU?



Why do so many of us think and act one way in the air and anothe way when we are back on good old terra firma? It's one world, you know. And it can become a better one only when your better side takes over when you are flyin It may help prevent an accident.

Yours.

So smile and have a good flight.

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